

TECHNOLOGY DEPT

PIRELLA GALLERY

FEB 5 1946

DETROIT

GAS

# MOTOR AGE



JANUARY 1946

A CHILTON  
PUBLICATION

# *Soft pressure does it!*



Millions of installations of Steel-Vent piston rings, in both rebore and re-ring jobs, have proved that the Hastings Steel-Vent *soft pressure* principle not only stops oil-pumping, it also checks the wear on cylinder walls.

You can use Steel-Vents with confidence in *any* rebore or re-ring job

## SOFT PRESSURE DOES IT — IN REBORES, TOO

*Here's the kind of endorsement Steel-Vent gets from jobbers and dealers all over the country:* "We have been using Steel-Vent rings in rebore jobs as well as in re-ring jobs for the past six years. The results we get have proven to us that it is the best ring for all kinds of jobs. Fleet operators are very much interested in holding down cylinder wear as well as more miles per ring job. We feel we have been able to give them these two things with Steel-Vents."

HASTINGS MANUFACTURING CO. • HASTINGS, MICHIGAN  
Hastings Ltd., Toronto

## **HASTINGS** STEEL-VENT **PISTON RINGS**



U. S. PAT. 2,146,997

**TOUGH** ON OIL-PUMPING **GENTLE** ON CYLINDER WALLS





**New...  
Gruv-Top\* Pilots  
Step Up Your  
Profits**

## on "Vibro-Centric"\* Valve Seat Grinding

**Increase Accuracy, Compensate for  
Worn Guides, Reduce Pilots Required,  
Save Time and Trouble**

Now Van Dorn "Gruv-Top" Pilots—employing an expanding-sleeve principle that makes self-centering automatic—add to the famous simplicity, speed and precision of "Vibro-Centric" Valve Seat Grinding. Now, more than ever, "Vibro-Centric" can help you make more money on valve jobs. Here's why:

**"Vibro-Centric" Is Fastest Because:** (1) "Gruv-Top" Pilots center themselves automatically, compensate for worn guides without lost time or motion; (2) Full-Powered Driver grinds at top speed—only a few seconds per seat; (3) Built-in Vibrating Action reduces stone loading and stone wear.

**"Vibro-Centric" Is Most Accurate Because:** (1) Concentric plunge grinding is most accurate; (2) "Gruv-Top" pilot finds *true* center of valve guide; (3) Accurate Dressing Stand puts true angle on seating stone.

\*Trade Mark Reg. U. S. Pat. Off.

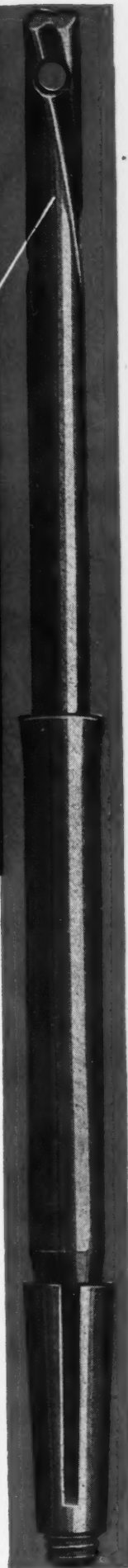
**"Vibro-Centric" Is Most Profitable Because:** (1) "Gruv-Top" Expanding Sleeve Pilots eliminate a costly stock of "plus and minus" pilots; (2) "Factory-accuracy" turns out perfect work *the first time*; (3) "Vibro-Centric" speed does more jobs per day.

Get the extra valve job profits that only "Vibro-Centric" can bring you. See your Van Dorn Distributor now. Or write for our handbook, "The Van Dorn System of Valve Reconditioning." Address: The Van Dorn Electric Tool Co., 727 Joppa Road, Towson 4, Maryland.

**FOR POWER SPECIFY**

**"Van Dorn"**  
(DIV. OF BLACK & DECKER MFG. CO.)

**PORTABLE ELECTRIC TOOLS**



AND DON'T FORGET YOUR

# Main Street Calls, JOE



Good advice for a salesman, because the importance of the smaller places is marked. 17,000 small cities and towns under 25,000, where nearly half of the nation's consumer goods are bought, can't be overlooked if sales are to be kept at peak.

And when you plan your advertising, the same advice is well taken. *Don't forget the Main Street calls.* PATHFINDER, fast growing family news weekly edited for the smaller places, is a direct route to this rich market. Edited for thoughtful influential people, no magazine has more influence with its subscribers, many of whom are merchants on Main Street. They are quick to note and appreciate the special attention given this market by advertisers.

With a million circulation guaranteed by December first, 1946, bonus circulation is well in advance of established advertising rates. Any way you look at it PATHFINDER is one of the outstanding advertising buys of the coming year.

## Pathfinder

FAMILY NEWS WEEKLY FOR MAIN STREET, U. S. A.

GRAHAM PATTERSON, Publisher



Advertising Offices: Philadelphia, 230 W. Washington Sq. • New York, 420 Lexington Ave. • Chicago, 180 North Michigan Ave. • Detroit, General Motors Bldg.





# Smart Guy!

SMART? . . . Sure he's smart. He knows there's a lot of difference between the three FORM-A-GASKETS!

FORM-A-GASKET No. 1 (a paste) sets fast but not too fast. It dries hard but not brittle. It's a swell product for making pressure-tight, leak-proof unions even when surfaces are warped.

FORM-A-GASKET No. 2 (a paste) sets a little slower than No. 1. It dries to a tough, pliable layer into which you can push your finger nail. It resists plenty of pressure—yet disassembles easily.

AVIATION FORM-A-GASKET No. 3 (a liquid) does not dry but it sets itself into position in a short time. It will not run when heated even to 400° F. Nor will it become hard and brittle at temperatures down to 70° below zero. It's a great, all-around product!

**PERMATEX COMPANY, INC.**

**BROOKLYN 29, N. Y., U. S. A.**

# You're on a "Coast-to-Coast Hook-up"

...when you're a TEXACO Dealer!



YES, you're a member of a big nation-wide family when you're a *Texaco* Dealer . . . and that pays dividends! For one thing, this famous sign is the *only* one that greets motorists in *all 48 states*. For another, there are several hundred thousand car owners with *Texaco Credit Cards* — *who stop at Texaco Dealers*.

Furthermore — *Texaco* magazine advertising, billboards and radio programs *plus* all kinds of local displays and sales help *keep car owners sold on Texaco Dealers and Texaco products*.

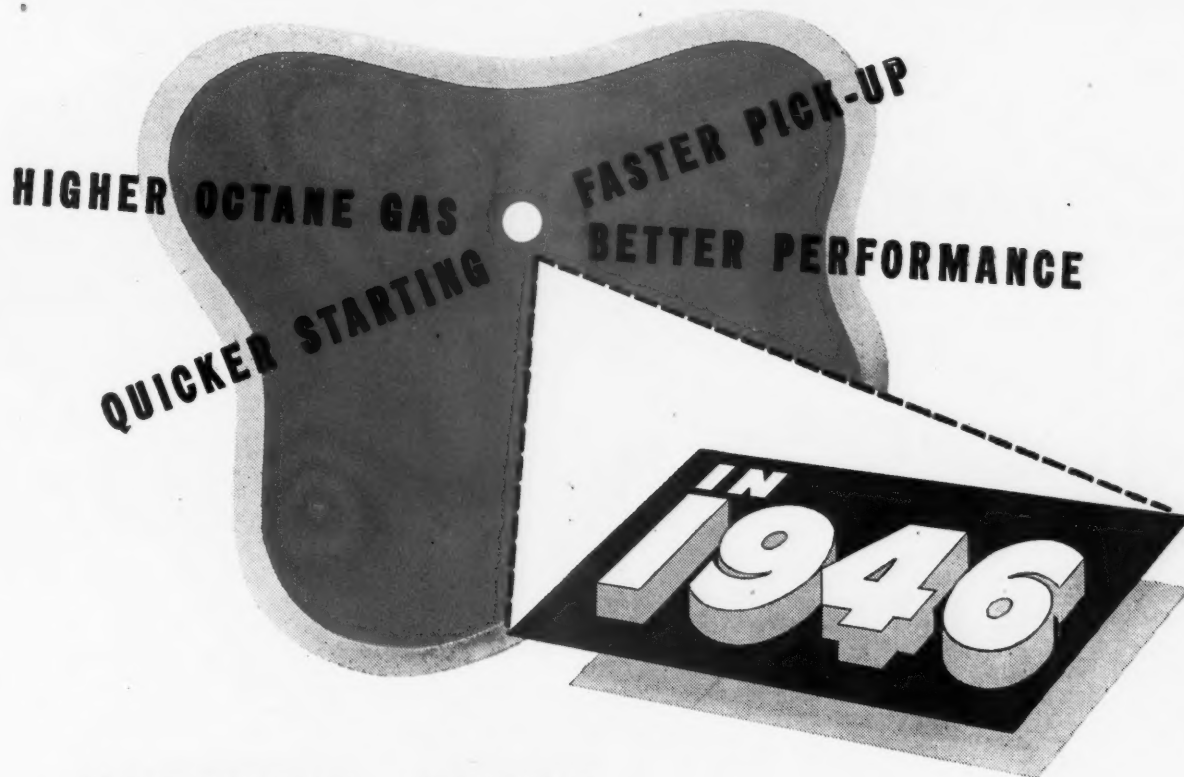
That's why we say *Texaco Dealers are busy dealers!*

THE TEXAS COMPANY

## *A Great Line-up for Texaco Dealers:*

**FIRE-CHIEF** and *Sky Chief* GASOLINES • **TEXACO** and **HAVOLINE** MOTOR OILS  
MARFAK CHASSIS LUBRICATION • REGISTERED REST ROOMS • ALL NIGHT SERVICE





## PERMITE PARTS . . .

*Engineered to meet Today's Tougher Operating Conditions*

The replacement parts you use to keep cars and trucks rolling will be put to a greater test than ever in 1946.

Heavier traffic, higher octane gas, resumption of the greater peacetime speeds, the need for keeping age-weary cars in safe operating condition — all mean that the parts you install **must be good**, for complete customer satisfaction.

Long recognized for their dependability, Permitte Pistons, Valves and other Permitte

Replacement Parts are adding to their laurels in today's strenuous service. Wartime engineering advancements are reflected in the Permitte Parts that are now giving new life and operating economy to the cars, trucks and buses on today's busy highways.

The complete Permitte Line of high-quality replacement parts is available to you through a nation-wide network of Permitte Jobbers and Distributors. If you do not know the name of your nearest Permitte Jobber, write us.

**ALUMINUM INDUSTRIES, Inc.**

CINCINNATI 25, OHIO



**PERMITE**

### R E P L A C E M E N T P A R T S

PISTONS  
PISTON PINS  
VALVES

VALVE GUIDES  
VALVE STEM KEYS  
VALVE SPRINGS

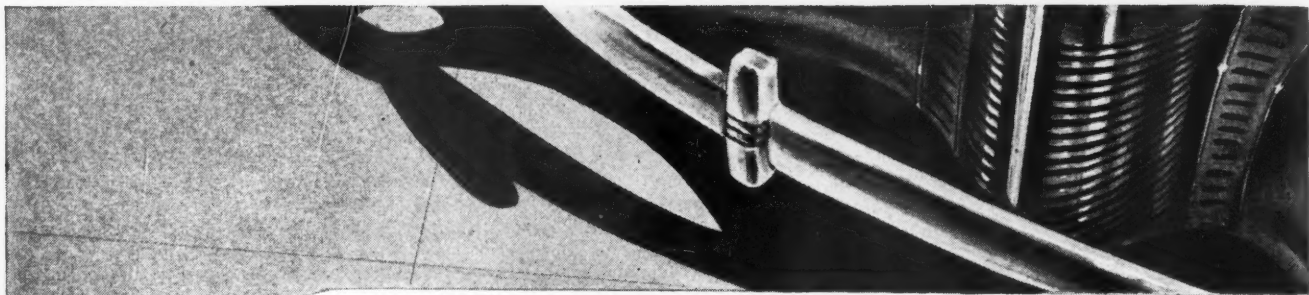
BOLT SETS  
TIE-ROD ENDS  
BUSHINGS

WATER PUMPS  
WATER PUMP  
REPAIR KITS

MUFFLERS AND  
CLAMPS  
TAIL PIPES

CYLINDER SLEEVES  
WET SLEEVE  
ASSEMBLIES

**THERE IS A PERMITE JOBBER NEAR YOU**



# *You'll be Glad*



**You'll be glad you waited  
for the finest Service Jacks  
ever built**

When you look at these sleek, trim Greyhounds — at your Walker Jobber's, someday soon—you'll be glad you waited for Walker. You'll thrill when you grip that form-fitting handle and get the feel of that powerful pump as it sweeps the "business end" of the Jack high into the air. Then, with fingertip pressure on the release, you'll watch it swish smoothly back into place and say to yourself, "Man, I'm sure glad I waited for Walker!"



Oh, happy day when you can kick out those worn-out "klunker" jacks that waste time, cause accidents and gum up your production schedule. Yes, it'll be a great day when you go modern with dependable Walker lifting equipment.

# You Waited for Walker

You'll be glad that you waited for the Lift that's

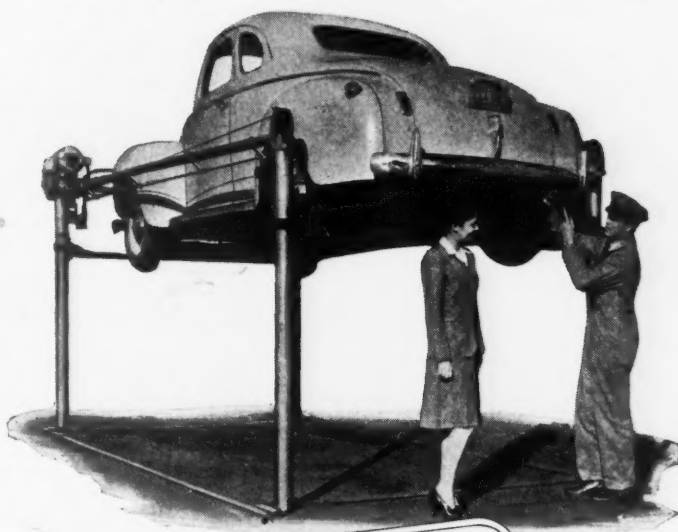
● Yes, you'll be glad when you're *all Walker* in the "lifting department"—with Walker Jacks to do the one-wheel and two-wheel lifting jobs and the famous Walker Electric Lift when you want the entire car up in the air.

You'll be glad because you'll have rugged, dependable, long-lasting lifting equipment that's safe and speedy . . . equipment that will give you the jump on costs—and competition.

You won't have to wait long—for we're building jacks and lifts faster than ever before. When you get yours, you'll be glad you waited. Ask any Walker owner.

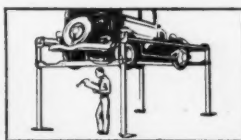
Built by the Walker Manufacturing Company of Wisconsin, Racine, Wisconsin—the same people that make the world's largest selling replacement muffler, the Walker "Individually Tuned" Silencer.

When you get a car up on your new Walker Lift, you'll really be *open* for business—for *all kinds* of business: inspection, lubrication, muffler replacement, wheel work, brake service, car washing. There's nothing under a Walker Lift to bump into or walk around. And there's nothing underground, either, which means Walker Lifts are easy and economical to install.



**OPEN  
FOR BUSINESS**

## WALKER ELECTRIC LIFTS



OPEN FOR WORKING, WALKING AND SELLING

# WALKER LEADS IN LIFTING EQUIPMENT



## Inside an engine, Pedrick rings cut oil costs "to the bone."

THERE'S NO MYSTERY to the performance you get with Pedrick rings. No magic or mirrors. You can rely on Pedrick "Heat-Shaped" rings to cut down excess oil-consumption, to stop excess wear and "blow-by," to get the most out of every engine.

Heat-Shaping is an exclusive Pedrick process that gives rings just the right pressure . . . not for just a short time but for the full life of the ring. And not just for certain parts of the ring, but all the way round. Heat-shaping is the

Pedrick way of insuring you an "all-round" ring for all-round use.

Install Pedrick rings in *guaranteed* Engineered Sets in the worn car, truck, bus, or tractor engines you overhaul, and you'll have them ticking like new. Pedrick ring-jobs help end high oil and fuel bills for your customers, and pleased customers mean a profitable business for you. WILKENING MANUFACTURING Co., Philadelphia 42, Pa. In Canada: Wilkening Manufacturing Co. (Canada) Ltd., Toronto.

**Pedrick**  
*precisioneered* PISTON RINGS




# BEST SELLER



WHEN YOUR JOBBER'S SALESMAN opens his new 1946 Grey-Rock catalog, he means business—for you! This new catalog is the book of the year for automotive service men. It's filled with Grey-Rock Products—ready to use—right for the job: Balanced Braksets—Standard Sets—Truck Sets—Heavy-Duty Brake Blocks—Clutch Facings—Fan Belts—Radiator and Other Hose—for every model car, truck, bus, tractor, and industrial application.

With this new catalog your Grey-Rock jobber's man has more data, statistical information, and application-help than ever before. He also has the complete story on how Grey-Rock quality products are made, what is behind them, and how you can merchandise and sell them. In this greatest service year in history you need Grey-Rock quality, and all the other advantages of the nationally advertised Grey-Rock line.

TO MAKE VEHICLES LAST, PUT QUALITY FIRST



## Grey-Rock

BALANCED BRAKSETS · FAN BELTS  
BLOCKS · CLUTCH FACINGS · HOSE



UNITED STATES ASBESTOS DIVISION of Raybestos-Manhattan, Inc., MANHEIM, PA.



High...

Medium...

Popular...

---

Only the Chrysler-Plymouth Franchise  
gives you a car in all 3 price classes!

**Y**OU don't have to tell any experienced businessman how much it means to be able to compete *at every price level*.

In the automobile field, only the Chrysler-Plymouth dealer enjoys this great advantage over competition.

With magnificent new Chryslers in every price class except the lowest . . . and with Plymouth, standout in the low price field, for the rest of his prospects . . . he has the broadest range of prices in the industry and a free run of the entire market!

The Chrysler-Plymouth dealer profits, too, from

the exceptional owner loyalty which both cars enjoy—a loyalty that has been further strengthened by the great performance record of Chrysler and Plymouth cars during the war.

He has Chrysler's new driving principle, *gyrol* Fluid Drive, on his side, plus many other advances pioneered by Chrysler's imaginative and resourceful engineering. And he can count on the sound, experienced counsel of factory-trained field men whenever he wants it.

Well fixed for the future? Ask any Chrysler-Plymouth dealer—he'll tell you!

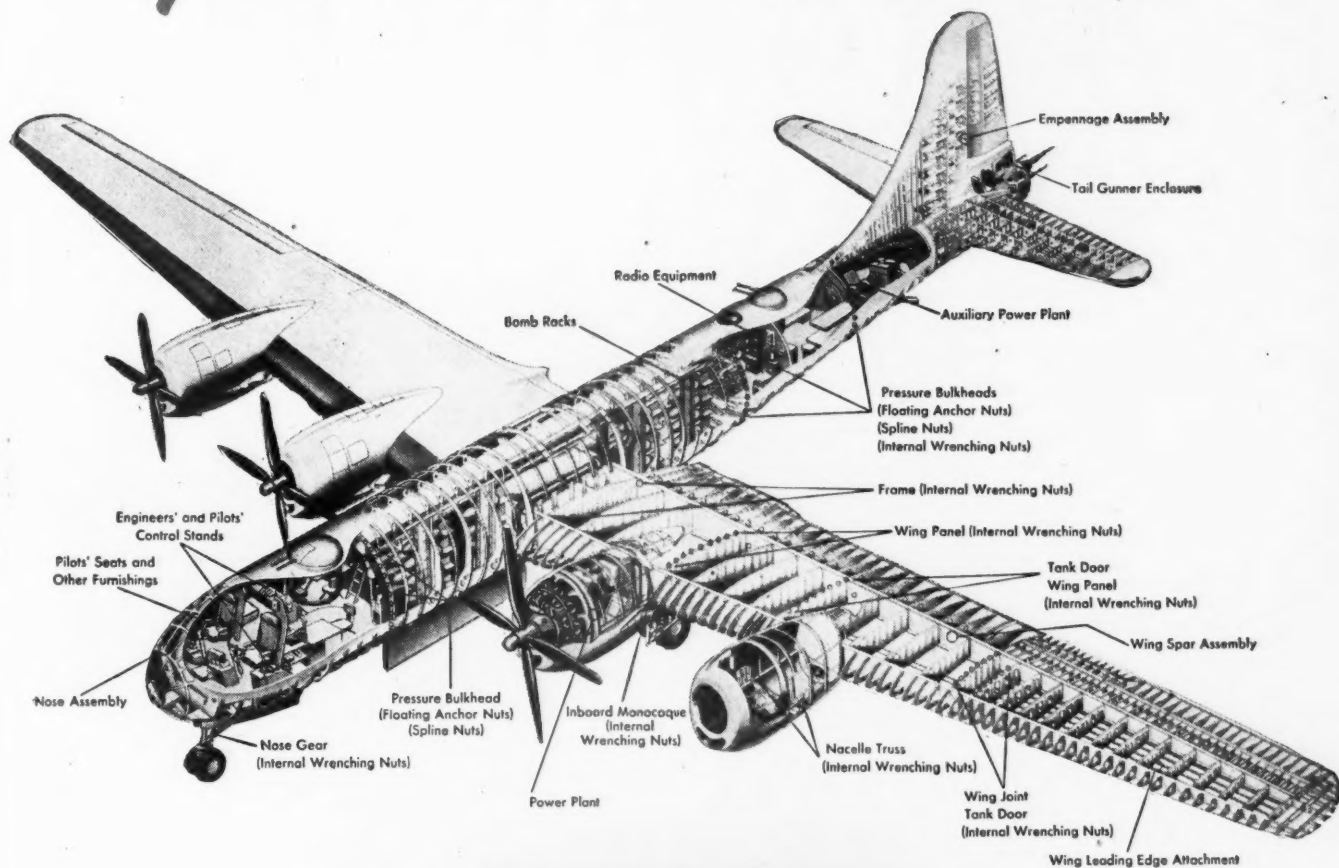
**CHRYSLER**

DIVISION OF CHRYSLER CORPORATION





# "Inside story" OF THE B-29



## SEVENTY-FIVE THOUSAND ELASTIC STOP NUTS

With military censorship now lifted, there's an important inside story that can be told.

From nose to tail, from wingtip to wingtip, there are 75,000 red-collar nuts in a single Boeing B-29 Superfortress. Seventy-five thousand Elastic Self-Locking Stop Nuts!

They spread stresses throughout the skin structure, as some day soon they will on automobiles, railroad cars, buses. They hold fast such heavy parts as engines and auxiliary equipment, as they will in tractors, trucks, industrial machinery. They assure tight connections in the electrical equipment of this "all-electric" plane, as they will in postwar home radios, sewing machines, vacuum



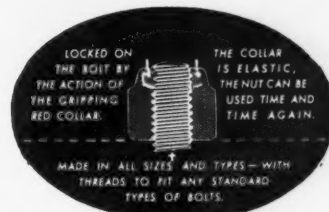
cleaners. They grip firmly on wheels, axles, structural framing, as they will on harvesters, combines, cultivators and other farm equipment.

It's hopeless to try to show 75,000 of these Elastic Self-Locking Stop Nuts in the drawing above—just as it's hopeless to try to list all the applications where

these red-collar nuts can help you achieve higher production and a more dependable product.

Let us send an ESNA engineer to confer with you and outline a solution for any fastening problems you may have.

LOOK FOR THE RED COLLAR  
THE SYMBOL OF SECURITY



**ESNA**  
TRADE MARK

**ELASTIC STOP NUT CORPORATION OF AMERICA**  
UNION, N. J.

JANUARY, 1946

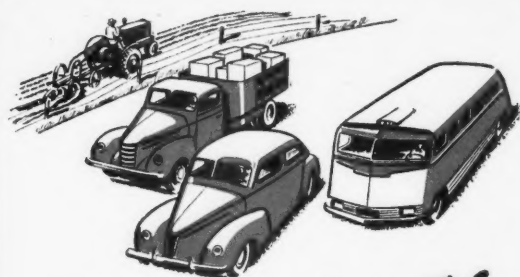
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11

# AUTO-LITE

## SPARK PLUGS

**IGNITION ENGINEERED**



*Original Equipment for  
Cars, Trucks, Buses, Tractors*

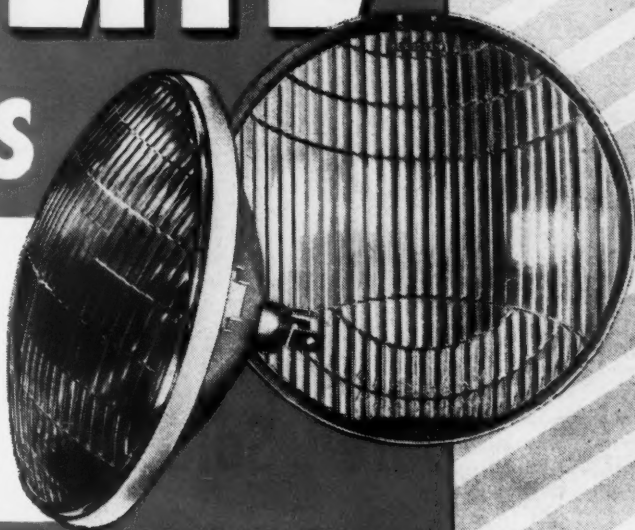
Auto-Lite Spark Plugs are ignition engineered by men who design and produce complete automotive electrical systems. That's why money cannot buy a better spark plug than Auto-Lite. Specified by leading engineers as original equipment on cars, trucks, buses and tractors for dependable service.

**THE ORIGINAL EQUIPMENT LINE**

# AUTO-LITE

## LIGHTS & LENSES

Auto-Lite Sealed Beam Units, with glass sealed to metal for durability and safety, are standard equipment for many makes of cars and trucks. Breakage of lens does not destroy the light. Securely sealed and accurately pre-focused, they are available for replacement on '40, '41 and '42 models.



# AUTO-LITE

## WIRE & CABLE

Many leading cars, buses, trucks and tractors are originally equipped throughout with Auto-Lite Wire and Cable. Types available include low-tension wire, Steelductor and copper spark plug wire, full-gauge battery cable; in cut-to-length sets or on spools as desired.



**THE ORIGINAL EQUIPMENT LINE**





## Put Purr in Performance with KESTER Cored Solders!

• The Solder you use can make the difference between a job that goes sour, and one that builds the reputation of your shop.

• With Kester Cored Solders, you can quickly, in one simple operation, make a tight union that stays put under shock, vibration, bending, contraction and expansion.

• Cut shop time and repair costs doing a "No come back" job the Kester Way. For electrical work use Kester Rosin-Core Solder. The patented plastic rosin flux, self contained in pure alloys, will not injure insulation or cause corrosion. Use Kester Acid-Core Solder to tightly and permanently bond water connections, gas lines, loose joints, cracks and radiator leaks. Keep both on hand always. Order from your jobber.

**KESTER SOLDER COMPANY**  
4242 Wrightwood Avenue, Chicago 39, Ill.  
Eastern Plant: Newark, N. J.  
Canadian Plant: Brantford, Ont.



**KESTER**  
*Cored Solders*  
FOR EVERY AUTOMOTIVE USE

# MOTOR AGE

With Which Is Combined AUTOMOBILE TRADE JOURNAL

FOR AUTOMOTIVE SERVICEMEN

Vol. LXV, No. 2

January, 1946

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## ATC "Globester" FURNISHES FRESH PROOF OF AC RELIABILITY



Aircraft  
Spark Plug

AC Aircraft Spark Plugs helped make aviation history when the Pratt & Whitney-powered Skymasters of the Air Transport Command inaugurated scheduled 'round-the-world flights on October 4, 1945. Not only was a new time record set (149 hours, 44 minutes) but new proof was furnished that AC "know how" produces spark plugs of *utmost reliability*—for AC's did their part. Veterans of the automotive industry are not surprised by this additional AC achievement. They have watched AC plugs make aviation records ever since AC built the world's first ceramic aircraft plugs—for the Liberty engines of World War I. They saw Lindbergh, Maitland, Acosta, Byrd, the Constellation, the Strato-cruiser, and the Japan-to-Washington B-29's . . . all AC flights . . . write aviation history. And, in the automotive field, they have seen AC rise to leadership in equipment,—and pioneer most of the spark plug improvements which are now standard in the industry.

1918 to 1946, AC Spark Plugs and *utmost reliability* go hand in hand. No wonder they mean better business and profits to dealers everywhere.

HELP FIGHT INFLATION—BUY VICTORY BONDS

# SPARK PLUGS

—SEND FOR AC SHOP MANUALS—	
Field Service Department, AC Spark Plug Division, General Motors Corporation 910 Mott Foundation Building, Flint 3, Michigan	
Gentlemen: Please send at once, no charge, the AC Shop Manuals checked:	
<input type="checkbox"/> HOW TO SERVICE SPARK PLUGS	<input type="checkbox"/> How to Service Fuel Pumps
<input type="checkbox"/> How to Service Oil Filters	<input type="checkbox"/> How to Service Air Cleaners
<input type="checkbox"/> How to Service Spark Plug Cleaner	<input type="checkbox"/> How to Service Speedometers
<input type="checkbox"/> How to Service Ammeters and other Instruments	
NAME _____	
FIRM _____	
STREET ADDRESS _____	
CITY _____	STATE _____



for minimum wear, also

## 26 BASIC DESIGNS

of Sealed Power Piston Rings

No doubt about it—oil control, blow-by control and low friction are all mighty important in piston rings. But getting these factors with a minimum amount of cylinder wear is vital, too—to insure long life for those other advantages. Sealed Power engineers have developed twenty-six (26) basic designs of piston rings for use in Sealed Power Individually Engineered Ring Sets to give that balanced performance. Whatever the make, model or degree of cylinder wear, there's a Sealed Power Set specifically engineered to do the best possible job in any engine. Sealed Power has been refining these sets for six years, has been producing rings for car, truck and engine manufacturers 34 years. For balanced performance, re-power with Sealed Power motor parts. Sold by America's leading distributors. Sealed Power Corporation, Muskegon, Michigan and Windsor, Ontario.

Piston Rings, Pistons, Cylinder Sleeves, Piston Pins, Valves, Water Pumps, Bolts, Bushings, Tie Rods, Front End Parts.

INDIVIDUALLY  
ENGINEERED

Keep Your War Bonds!  
Get \$4 for \$3!



# SEALED POWER PISTON RINGS

BEST IN NEW CARS! ★ BEST IN OLD CARS!



## NEWS BULLETIN

★ Informed guesses are that new car production will reach 500,000 per month by July.

★ As Motor Age goes to press there are no definite indications as to the ending of the G. M. strike.

U. S. Census figures show low unemployment in November with retail sales high.

★ Truck production is now at two-thirds of 1939 rate, reaching 52,000 units in November to make a total of 639,000 units for 1945.

Farm machinery production, recovering from the low of \$35 million dollars in September, has still not reached the \$45 million peak of last February.

★ With total receipts from farm marketing in 1945, 7 per cent above the previous year, a strong demand for cars, trucks and farm equipment is indicated.

Employment at Ford's River Rouge now stands at 71,040 men and women, compared to a war-time peak of 100,172, but hiring is continuing at about 300 per day.

There will be no more bond drives, but the Treasury will continue to sell E, F and G bonds which will be called U. S. Savings Bonds.

Dutch Government is going into the trucking business and will start with a fleet of ten-ton, ten-wheel Diesel jobs running from Rotterdam to Czechoslovakia.

★ Does the reimposing of priorities on building materials presage a new batch of governmental controls?

Labor situation is producing bottle necks which will jam construction for many months after workers' problems have been settled.

★ The New Year was ushered in with the highest rate of car production since the start of the G. M. strike.

Returning Vets recalling the war-time strikes which slowed production of desperately needed production and viewing the current strikes stopping reconversion, are asking if this is what they fought for.

★ New York State and Virginia are being used as test states for the sale of synthetic lubricating oil which doesn't alter its viscosity with changes in temperature.

★ Cleveland Trust Co. states that we are now entering a primary post-war depression.

No manufacturer will produce to capacity while price ceilings prevent him from selling goods at a profit.

Four industries account for three-fourths of our productive efforts - food, construction, clothing and automobiles.

★ Increased activity is evident in the development and testing of automatic transmission units.



### Denver Dealers Form Accessories Co-op

**A**UTO dealers, following the lead of many farmers, have formed a co-op, known as Auto Dealers, Inc., to buy accessories in quantity lots. The corporation which was formed in Denver is claimed not to conflict with existing channels of distribution and manufacturers. It would seem that their field would be limited. Such accessories and parts that the dealers do not secure from their respective factories would be obtained as in the past from local jobbers who featured and emphasized service. Thirty-eight of Denver's forty dealers are said to have joined.

### Paralysis of Auto Industry, Left Wing Aim

**C**OMPLETE paralysis of the automotive industry through strike blockade is being sought by left wing groups in the labor movement it is reported.

### NBBB Submits Proposals To Auto Finance Field

**T**HE National Better Business Bureau has entered the automobile financing situation with a series of proposals for clarifying and controlling time contract paper. It submitted its program to representatives of the car financing field in New York recently.

The recommended program provides that each conditional sales contract show separately in dollars and cents the carrying charges and insurance charges. A second provision asks that no bank, finance company or other agency discount contracts which do not list these items individually. Other recom-

### 1945 PASSENGER CAR PRODUCTION IN U. S. BY MAKES

Chrysler Corporation	
Chrysler .....	402
Desoto .....	1,250
Dodge .....	2,694
Plymouth .....	2,568
	6,914
Ford Motor Company	
Ford .....	34,713
Lincoln .....	568
Mercury .....	2,848
	38,129
General Motors Corporation	
Buick .....	2,481
Cadillac .....	1,205
Chevrolet .....	12,776
Oldsmobile .....	3,956
Pontiac .....	4,050
	24,468
All Others	
Hudson .....	4,905
Nash .....	6,148
Packard .....	2,989
Studebaker .....	7
Willys .....	None
	14,049
<b>Total—All Makes</b>	<b>83,560</b>

mendations are that all financing agencies advertise that they will provide copies of their rate charts to the public on request, that finance companies file their rates with local Better Business Bureaus, and that the bureau ask the public to compare chart rates with those of the car dealer. The plan was outlined to members of banks, finance companies, and car dealers. A committee was named to consider the program to report its recommendations.

**New four-cylinder engines will be the keynote in Crosley models. Proved successful in use by the Navy the new engines will feature many changes and improvements. Read the interesting article on page 24 of this issue.**

### Situation Unchanged at GM Strike-bound Plants

**L**ITTLE progress is reported in the General Motors strike since the corporation withdrew from the hearings of President Truman's fact-finding board in Washington last week. The board heard the presentation of UAW-CIO, and considered the Dept. of Commerce report holding that an increase of 15 per cent in wages is feasible without an increase in car prices.

In Detroit a reinforced picket line of UAW-CIO strikers prevented non-strikers from entering the GM Transmission Div. plant. In Pontiac the Circuit Court of Oakland County granted GM a temporary injunction restraining pickets from interfering with office workers and other non-strikers at three plants. The order permitted peaceful picketing.

### Standardization for British Auto Industry?

**S**TANDARDIZATION of the English motor car industry to put it on a competitive basis with American manufacturers has been urged by Ellis Smith, member of the Board of Trade, according to a London report. He said that standardization of a few types of automobiles is urgently required as a means to reduced costs. He pointed out that on the basis of 1938 prices the cost of a motor car in Britain was 28 cents a pound, whereas in the United States where wage levels were twice as high as those in England it was only about 18 cents a pound.

## Bottlenecks Hold Back Construction Boom

**E**RECTION of new buildings by dealers is going ahead slowly. This results not only from a shortage of skilled carpenters, masons, plumbers and electricians but also from the scarcity of building materials and equipment. Major shortages center around cast iron soil pipe, brick, gypsum board and, most particularly, lumber. In spite of the fact that the military services had cancelled more than a billion feet of lumber, production after the war dropped so severely that there is still an extreme shortage delaying the construction of dwellings and business enterprises. Wage and price problems seem to be the root of the lumber production difficulties.

The same situation exists in the cast iron soil pipe, brick, gypsum board and lath fields. As a result some dealers and independent repair men are modifying or delaying their post-war building plans until there is some assurance that the work, once started, will be completed in a reasonable time.

## Automatic Transmissions On 1947 Ford Models?

**I**NCLUSION of some type of automatic transmission as optional equipment on 1947 Ford cars is a possibility, according to R. H. McCarroll, executive engineer of Ford Motor Co. Engineerwise, he said, the 1947 Ford already is completed and engineers now are thinking in terms of the 1948 models. The company is aiming at Sept. 1 as the announcement date for its 1947 models, he said.

## Prices for Chrysler Cars Are Received

**A**S MOTOR AGE went to press, announcement of retail prices, exclusive of taxes, transportation, and handling charges for new Plymouth, Dodge, De Soto and Chrysler cars, products of the Chrysler Corp., was made. Prices will average about 1.8 per cent above prices for 1942 models, plus additions for engineering changes, it was reported.

OPA made the announcement and in addition fixed price ceilings for four additional Ford models. These models average 2 per cent higher than 1942 prices, plus from \$18.10 to \$47.29 for engineering improvements.

The increase, OPA stated, is "around 1 per cent," plus \$70 to \$121 for engineering improvements. On Dodge models, the increase is 3.5 per cent with from \$59 to \$68 for engineering improvements. De Soto cars will have an increase of 1.8 per cent, plus \$59 to \$66, while for Chrysler models the price is up, "less than one-half of one per cent," plus \$90 to \$104.

On Ford models, OPA reported, increases are about the same as those announced last fall for other Ford cars.

Dealers' discounts will be cut 2½ per cent, according to OPA. It was unfortunate that there was no time to query dealers on their reactions to these latest price announcements.

**The long awaited announcement concerning the Kaiser car has been released. Featuring front wheel drive, the new model is said to combine a number of design and engineering improvements. For the first complete mechanical details on the new Kaiser see page 20 of Motor Age.**

## There's Some Good News, Too

**D**EALERS and others in the automotive industry will welcome the news that the new post-war tax law repeals the Federal \$5 use tax, effective next July. A great deal of adverse comment centered around the tax, and came from many quarters particularly during the gas rationing period when car owners felt they were not getting the use of their car.

## Kaiser-Frazer Reveals Production Plans

**K**AISER-FRAZER CORP. hopes to price its Kaiser car at only slightly more than the Ford, Chevrolet, or Plymouth. Production of the Kaiser is expected to get underway in late May or June, according to company officials. The car is different from the conventional automobile in that it has front-wheel drive and torsion bar suspension. Many of the design features were patterned after those used in the French Citroen.

Joseph W. Frazer, president, told a news conference in Detroit that the company has received 11,000 applications for dealerships.

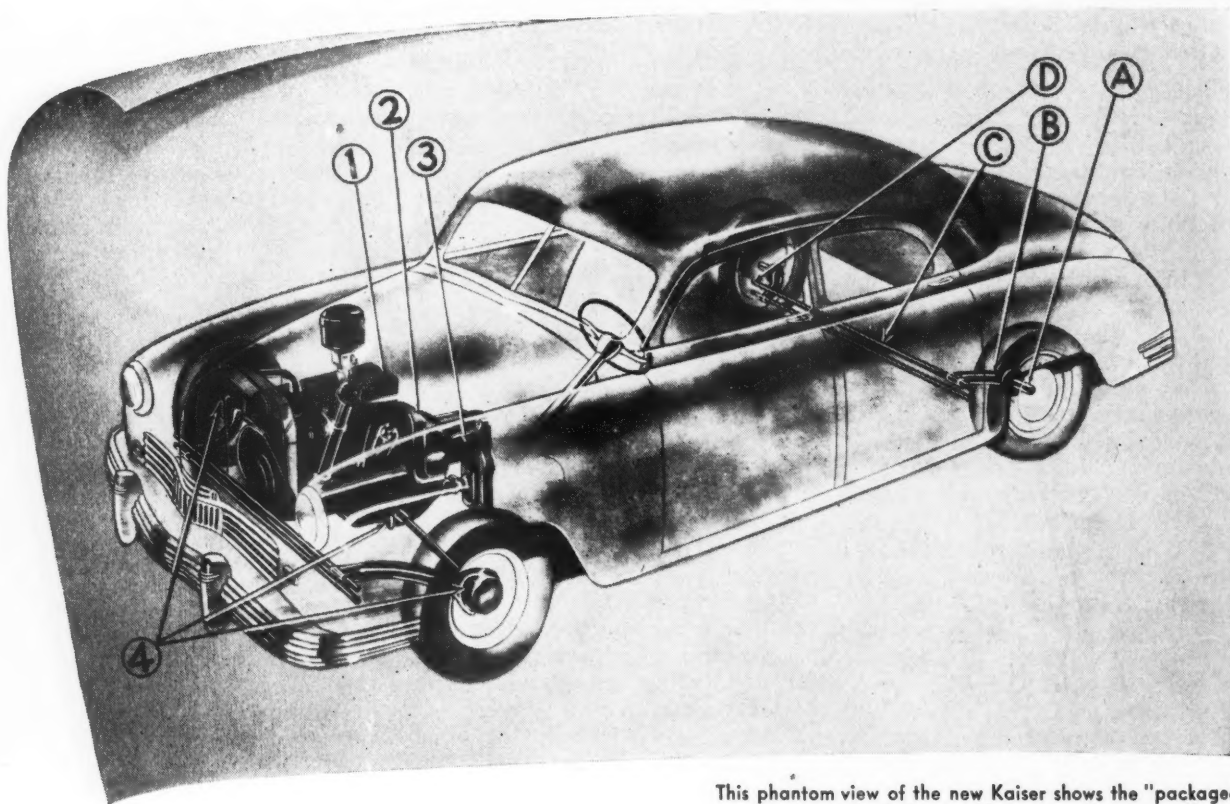
## Trying to Stretch 'Em Around for All

**C**HRYSLER CORP. started shipping new cars to distribution points throughout the country late in December. It is reported that most of the cars were not complete, chiefly because of a shortage of die castings. The cars will not be placed with dealers until enough have been shipped to provide each dealer with at least one.



# Low Priced Kaiser Has Front Drive

Long awaited car features torsion-bar springing, 85 HP 6 cylinder engine and front wheel drive of unique design. No prices revealed



This phantom view of the new Kaiser shows the "packaged power" front-wheel drive and the new "torsionetic" suspension (A.B.C.D.), two of the outstanding features of the new car. The "packaged power" assembly combines engine (1), clutch (2), transmission (3), and final drive assembly (4), in a single unit which can be lifted clear of the integral body-and-frame for easy service.

**F**RONT drive and torsion bar springing are among the outstanding features contained in the preliminary announcement of the new Kaiser car.

This car, which is the first new name to be added to the roster of American-built cars for many years, and whose details have been awaited with great interest by the entire automotive industry, will have its initial showing in New York late in January. Prices, not available at press time, will place the car in the "low-price" field.

An unusual feature of the front drive is that instead of the engine driving forward through clutch and transmission to the driving axle, the engine is placed ahead

of the axle. It is claimed that this type of construction maintains a better center of gravity which results in better traction on hills and improved weight balance.

The power plant—engine, clutch, transmission and driving axle, form a single assembly with the engine, clutch and transmission so arranged that they can be easily removed as a unit for ease of servicing. The six cylinder engine develops 85 hp. No details were released on construction of the engine but it is probably of L-head type, with four main bearing crankshaft, light weight aluminum pistons with a compression ratio in excess of 6 to 1 and developing maximum power at speeds of ap-



The new Kaiser with its flowing front-to-rear fender lines is shown above in the illustration. The sleek body is full size, six passenger, and includes such features as a specially-designed six cylinder engine and an independent "torsionetic" suspension system.



of 117 inches, should provide a car of unusual riding qualities.

Body and chassis form a single unit of the type known as "Monocoque." This results in a strong rigid structure of light weight which eliminates strain, shifting between body and frame and body squeaks.

As a result of the front drive, eliminating the propeller shaft to the rear axle and also the "monocoque" body construction, bodies are unusually low and the lowness is still further accentuated by the single sweep-from-front-to-rear fenders. The smooth lines of the exterior are emphasized by the use of concealed door hinges and recessed license plate space.

Inside, the bodies are roomy without the "tunnel" which characterizes most rear drive cars. Unusually wide front and rear seats are also provided. Door controls on the inside are of the concealed push-button type, while outside handles are described as "trigger" action.

Door and window controls are of plastic and Lucite. Upholstery is of two-tone broadcloth and the large rear window is contoured to the curves of the body.

Riding comfort is improved through the "pressure-chamber" ventilating system designed to eliminate drafts. Further contributing to the passengers' comfort and general riding qualities, are wide-base wheel rims which also increase tire life. Other features include new type, equalized, self-centering four wheel brakes.

Coincident with the preliminary announcement covering the car, Henry J. Kaiser and Joseph W. Frazer, chairman and president respectively of Kaiser-Frazer Corp., disclosed that the corporation has filed with the Securities and Exchange Commission a Registration Statement

(Continued on page 56)

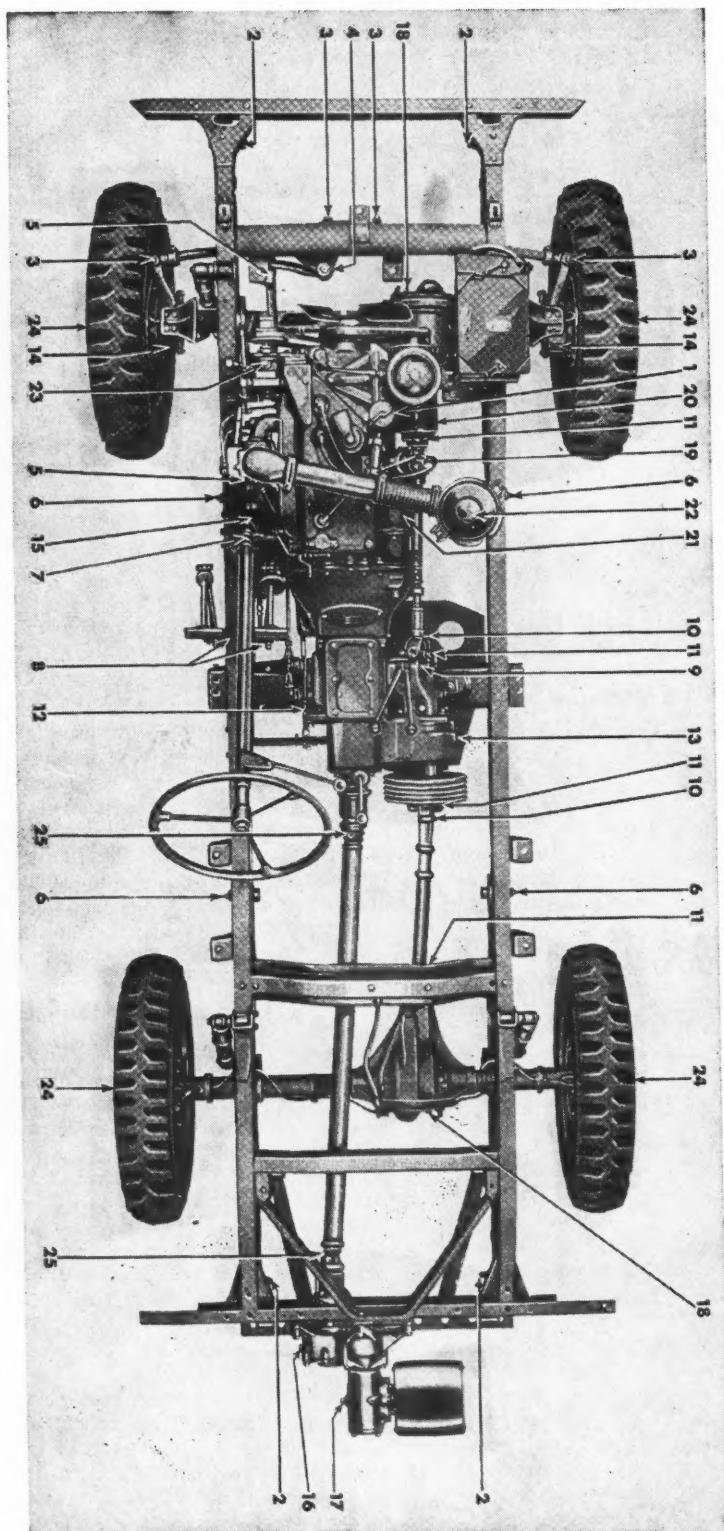
proximately 3000 r.p.m. The engine is entirely new and was designed by Continental Motors and Kaiser-Frazer engineers.

Kaiser describes the springing as independent "torsionetic" suspension. As shown in the illustration, each wheel is provided with its individual crank and torsion bar. The cranks extend forward from the wheels to the torsion bars which extend across the chassis to the opposite side. As the wheel passes over road irregularities the lever moves with the wheel, twisting the torsion bar. Hydraulic shock absorbers are included in the design. These features, coupled with the relatively long wheelbase

# 1946 Universal Jeep

## LUBRICATION

When lubricating the 1946 Universal Jeep, follow this detailed procedure for faster and more efficient service



**C**HECK oil level daily. Below 32 degrees—SAE 10-W. Above 32 degrees—SAE 20 or 30. Change every 2000 miles or 50 hours. Capacity 5 qts. with filter.

### 1. Engine Crankcase

Pressure Gun Grease every 1000 miles or daily for field work.

### 2. Spring Shackles

Pressure Gun Grease every 1000 miles or daily for field work.

### 3. Steering Tie Rod Ends

Pressure Gun Grease every 1000 miles or daily for field work.

### 4. Steering Bell Crank

Pressure Gun Grease every 1000 miles or daily for field work.

### 5. Steering Connecting Rod Ends

Pressure Gun Grease every 1000 miles or daily for field work.

### 6. Spring Pivot Bolts

Pressure Gun Grease every 1000 miles or daily for field work.

### 7. Gearshift Remote Control

Pressure Gun Grease every 1000 miles or daily for field work.

### 8. Clutch and Brake Pedal Shaft

Pressure Gun Grease every 1000 miles or daily for field work.

### 9. Transfer Case Lever Shaft

Pressure Gun Grease every 1000 miles or daily for field work.

### 10. Propeller Shaft Slip Joint

Pressure Gun Grease every 1000 miles or daily for field work.

### 11. Propeller Shaft Universal Joints

Pressure Gun Grease every 1000 miles or daily for field work.

### 12. Transmission

Fill to level plug. Capacity 3 pts. Below 32 degrees use SAE 80. Above 32 degrees use SAE 90. Check level every 6000 miles or 300 hours for field work.

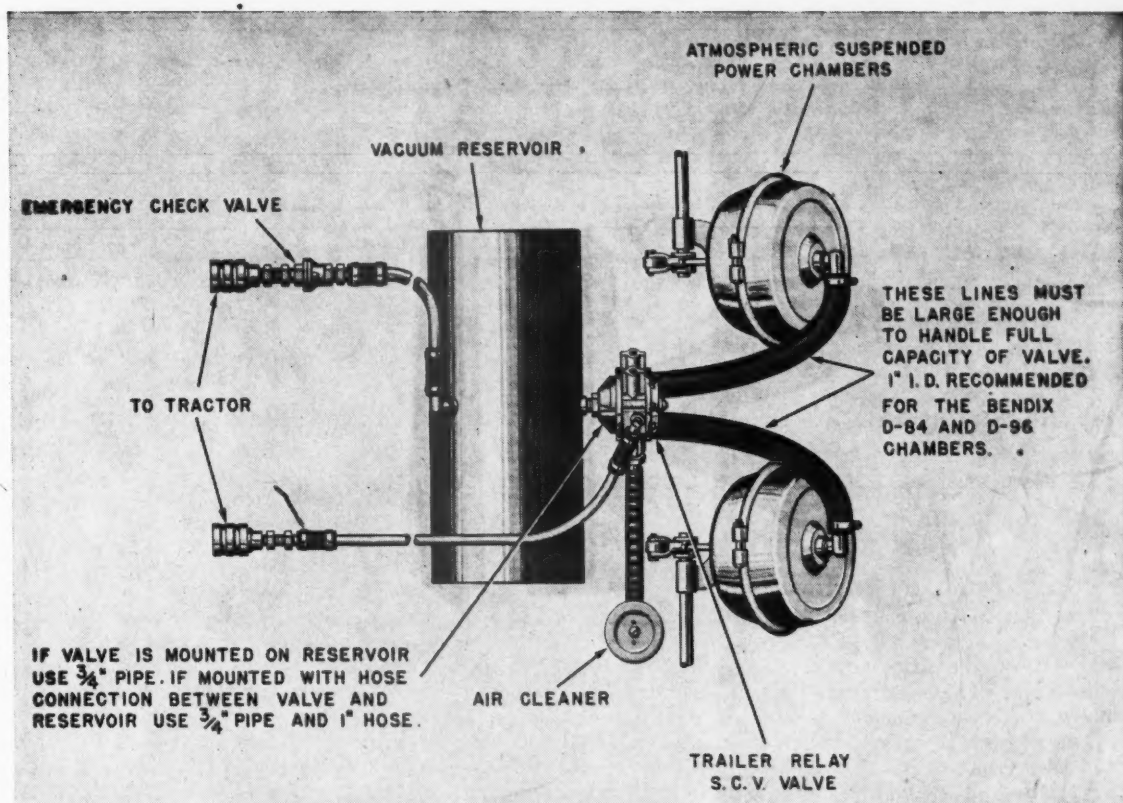
### 13. Transfer Case

Fill to level plug. Capacity 3 pts. Below 32 degrees use SAE 80. Above 32 degrees use SAE 90. Check level every 6000 miles or 300 hours for field work.

### 14. Front Axle King Pin Bearings and Universal Joints

(Continued on page 60)





## Synchronizing Tractor and Trailer Brake Operation

The following points outlined in this article should be carefully checked to reduce to a minimum the time lag between the application of tractor brakes and trailer brakes

**T**HE importance of synchronizing tractor and trailer brake operation on vehicles equipped with vacuum power braking has been recognized by fleet operators and engineers over a long period of time. Due to improved operation of vacuum power brakes on tractors, this need has become even more prominent. Even before these improvements in the braking systems of the tractors, balancing of the brakes between the tractor and the trailer presented a real problem. The ideal situation, of course, would be for the tractor brakes and the trailer brakes to be applied simultaneously. In most installations, there is an appreciable time lag in the application of the trailer brakes with respect to the tractor brakes. This results in the tractor doing more than its share of braking. This in turn, results in increased maintenance of the tractor brakes, and unsatisfactory operation of the tractor-trailer combination from a brake standpoint. If the condition is too severe, there is a tendency to brake too hard which

presents a real safety hazard, and should be avoided.

Before attempting to synchronize the operation of the tractor and trailer brake combination, it is advisable to check the condition of the brake system on the trailer. Any binding in the levers, or the links, should be corrected, or replacements should be made, if necessary. The operating mechanism should be checked for misalignment and necessary corrections made. Check for restrictions in the vacuum line due to collapsed hose or kinked tubing. Also look for leaks in fittings or connections, leaking, sticking, or inadequate trailer valves, worn brake linings, damaged power chambers, and worn valve parts.

It is generally found that even after the trailer brake system is restored to good condition, the system is too slow to work satisfactorily with the improved tractor brake system. To overcome this condition, the usual remedy is the installation of a faster operating relay valve on the

(Continued on page 62)

# Crosley Features

## New Four Cylinder Engine

**Newly-developed 26 HP four-cylinder engine used successfully by the Navy during the war will be featured on Crosley postwar models . . . . by Joseph Geschelin**

**A**LTHOUGH the details of the 1946 Crosley car are not yet available, Crosley Motors, Inc., Cincinnati, Ohio, has released complete data on its unique powerplant which embodies unusual features of design and manufacturing processes.

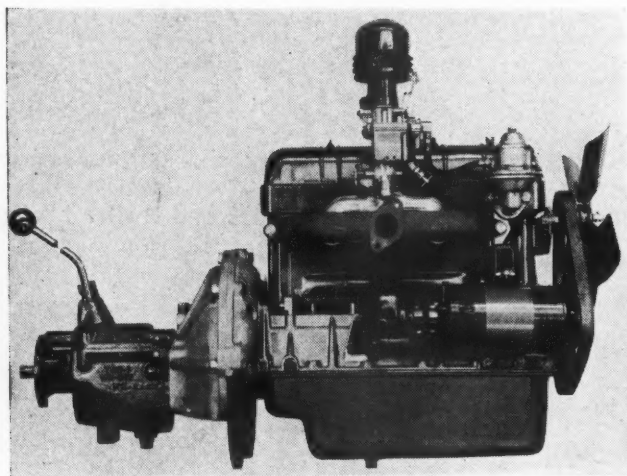
It is possible to say at this writing that the 1946 Crosley will be a two-door sedan model, seating four, mounted on a wheelbase of 80 in., and tread of 40 in., with a shipping weight of 1000 lb. Although the new car will be 28 in. longer and two inches wider than the 1940 model, its weight is just about the same. Major credit for weight economy goes to the newly developed engine. The previous model had a displacement of 35.2 cu. in., developed 12.5 hp., and weighed 188 lbs. complete. By contrast the new engine develops 26 hp., and weighs 138 lb., complete

with all accessories including generator and starter. It weighs but 59 lbs. without accessories.

Maximum speed of the 1946 model is given as 65 mph. Fuel economy for this higher performance car is said to be even better than for the 1940 job. According to test results with a 1200-lb. experimental car with 350-lb. payload, they showed a fuel economy of 50 mph. at 30 mph., and 35 mpg. at a speed of 55 mph. At maximum torque the specific fuel consumption is 0.48 lb./bhp. hr.

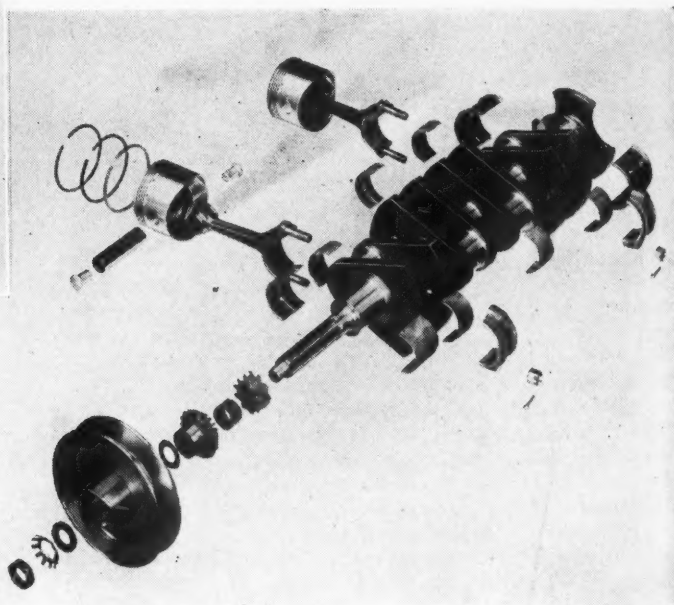
Specifications of the new engine are as follows: 4-cyl., valve-in-head, 2.5 in. bore x 2¼ in. stroke, 44 cu. in., displacement, with maximum of 26 hp. at 5200 rpm. with compression ratio of 7.5 to 1. As will be described later, the engine is fabricated of steel stampings, and, conse-

*(Continued on page 64)*



Side view of the engine, indicating design and construction. Numerous improvements and engineering developments are embodied in the engine.

The crankshaft is fully counter-balanced. Rod and main bearings are of the slip-in type, and the alloy pistons have three rings.

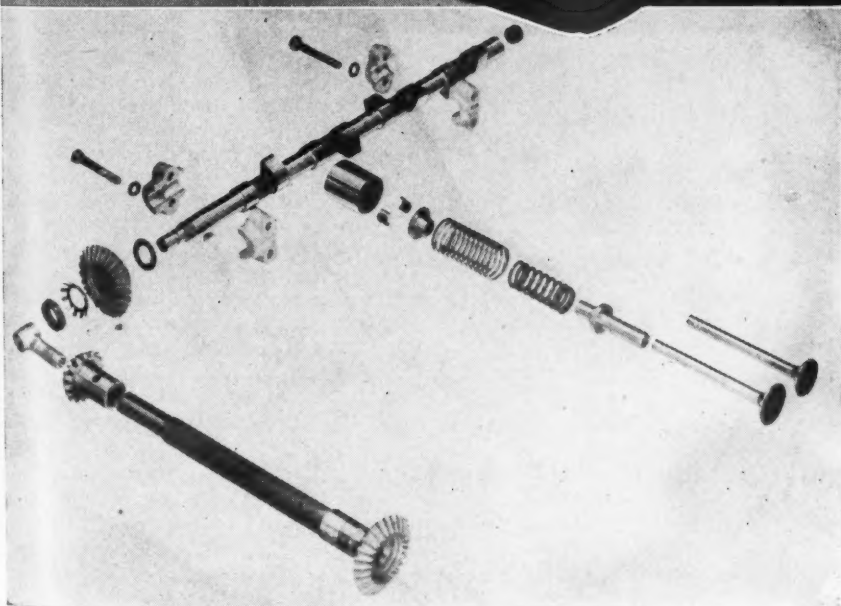
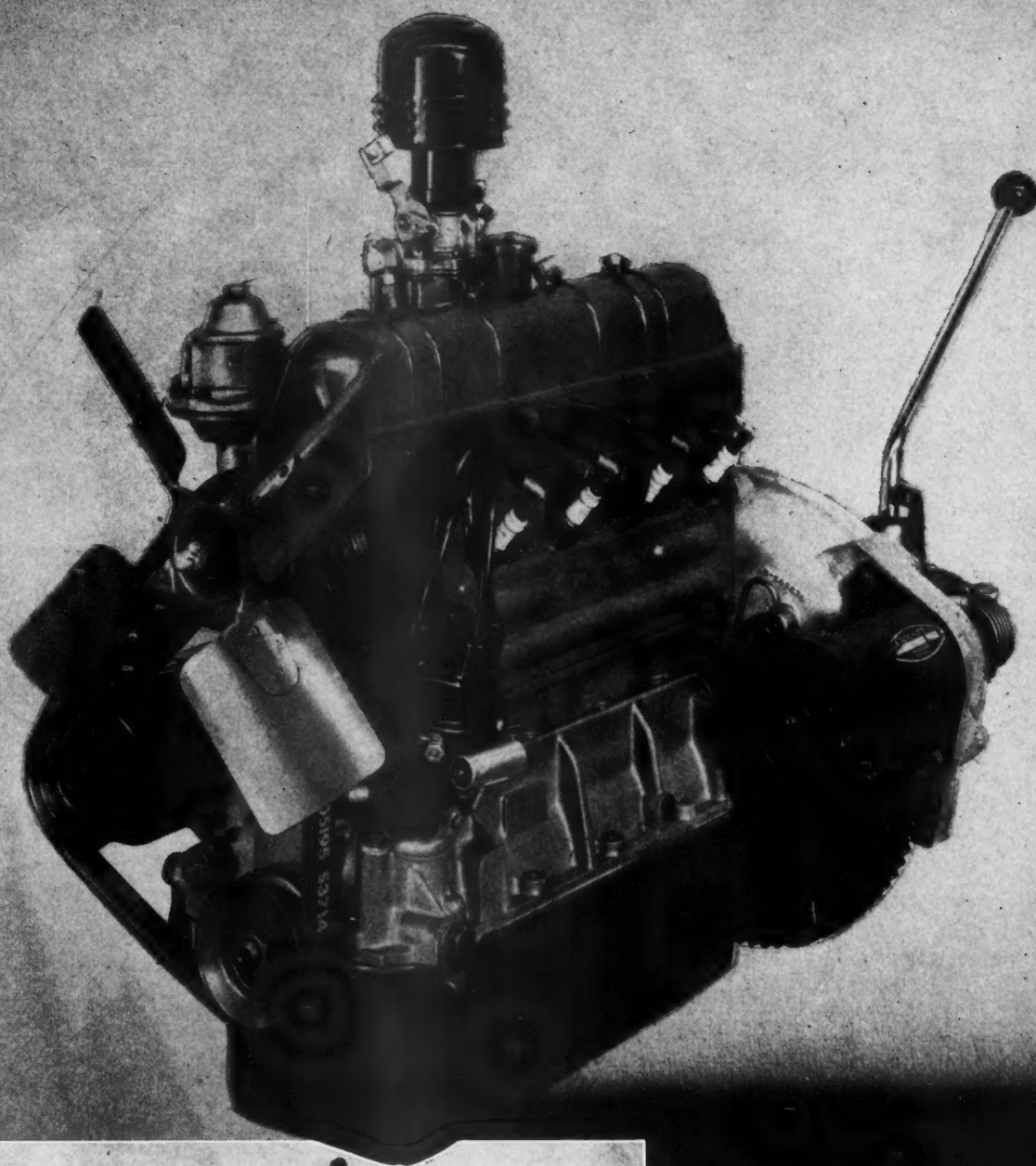




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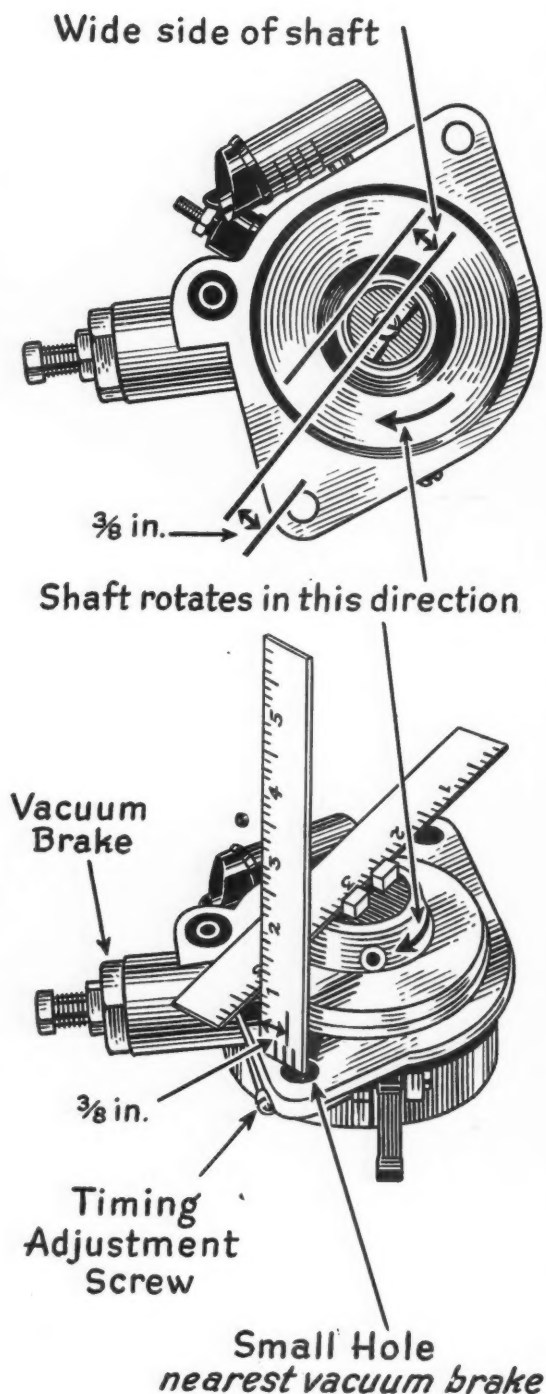
Three quarter view of the new four-cylinder Crosley engine which develops 26 hp. and has a total weight of 138 lb. complete with accessories.

Exploded view of overhead camshaft, showing drive shaft and gears together with valves, lifters and springs.



By BOB TURNER

# Servicing the 1946 Ford Truck Distributor



To correctly set the basic timing of the distributor on models 59T, 598T, 594T, follow this detailed procedure

**T**HE distributor is mounted on the front of the timing gear case and is driven by an offset slot in the camshaft and a tongue on the distributor shaft. The breaker mechanism consists of an eight lobe cam operating two sets of breaker points. The left hand set of breaker points opens the ignition circuit and the right hand set closes the circuit. The timing is automatically advanced or retarded by centrifugal governor weights. An adjustable vacuum brake is provided to automatically retard the spark in direct proportion to the load.

Before attempting to remove the distributor from the engine, disconnect the battery ground strap. Remove the low tension wire from the distributor, and unsnap the clip on each side of the distributor cap, allowing the cap to hang by the spark plug wires. Take out the two cap screws that hold the distributor assembly to the timing gear case, and remove the distributor and the gasket.

Remove the rotor from the distributor shaft. Inspect the points and if they are badly burned or pitted, they should be replaced. After the new points are installed, turn the distributor cam until the rubbing block on one of the breaker arms is resting on the high point of the cam. By turning the eccentric adjusting screw, set the points with a feeler gauge to .014 to .016 inch. Tighten the movable point lock screw. Now turn the distributor cam so that the points are closed. Check the points to make sure that they close squarely and contact the entire surface of the points. If it is necessary to align the points, use a suitable bending tool, bending only the bracket which holds the stationary point. After aligning the points, it will be necessary to check the gap setting and make any correction required. Repeat this same operation on the other set of points.

After the points have been installed and correctly set, it will be necessary to check and reset the basic timing. Place a scale against

(Continued on Page 72)

# Control Tower Speeds Service Traffic

Loss of time in assigning repair jobs and wasted motion have been cut to a minimum in this shop after a modern system of controlling traffic had been installed.....by E. C. Pitkin

**D**ISPATCHING jobs quickly is essential and necessary in modern automotive shops in order to build greater volume, and the Blaul Motor Company, St. Paul, Minnesota, emphasizes speed for all service work dispensed from a service control tower installed at one side of the service room. The tower has done much to increase shop business.

Service men write their order which is sent to the control tower. Here it is recorded on a daily work sheet. The entire day's work sheet is then posted at the front of the tower so the manager knows just what work can be promised for future delivery.

A system of colored lights installed just below the tower indicates quickly how the work is progressing. A green light means that the job has been completed and can be taken; an amber light, that the control should be called; a red light, that the work will have to be made on appointment and done on order.

A public address system speaker is installed in each of the mechanic's stalls. The control operator gives the license number of the car to be worked on. The work is

broken down, according to the normal time for each operation which the shop has worked out. The work is mapped on the basis of time limits. When time is full, work has to be taken on appointment. By this method, customers know just when they can expect their cars—they know a Blaul promise will be kept.

The control operator is so located that he can see the whole floor and keep in constant touch with the mechanics. A posted calendar in the tower shows at a glance how much work can be taken and when delivery promise can be made.

Service traffic, handled by the new service control system, schedules the shop work so as to attain the greatest speed and efficiency. The car moves quickly from station to station, in accordance with its needs, and receives the careful attention of specialists, each trained in a particular branch of service work. "The best possible job in the shortest possible time" is the by-word of the firm.

A perpetual customer follow-up board keeps the shop in constant touch with customers, whom it notifies, both by mail and by telephone, each thirty-day period of their car's lubrication and check-up needs.

James P. Blaul, owner and general manager, who was formerly manager of the Motor Power Equipment Company's Oldsmobile Dealerships in both St. Paul and Minneapolis, organized the new company which occupies the establishment previously used by the Motor Power Equipment Co.

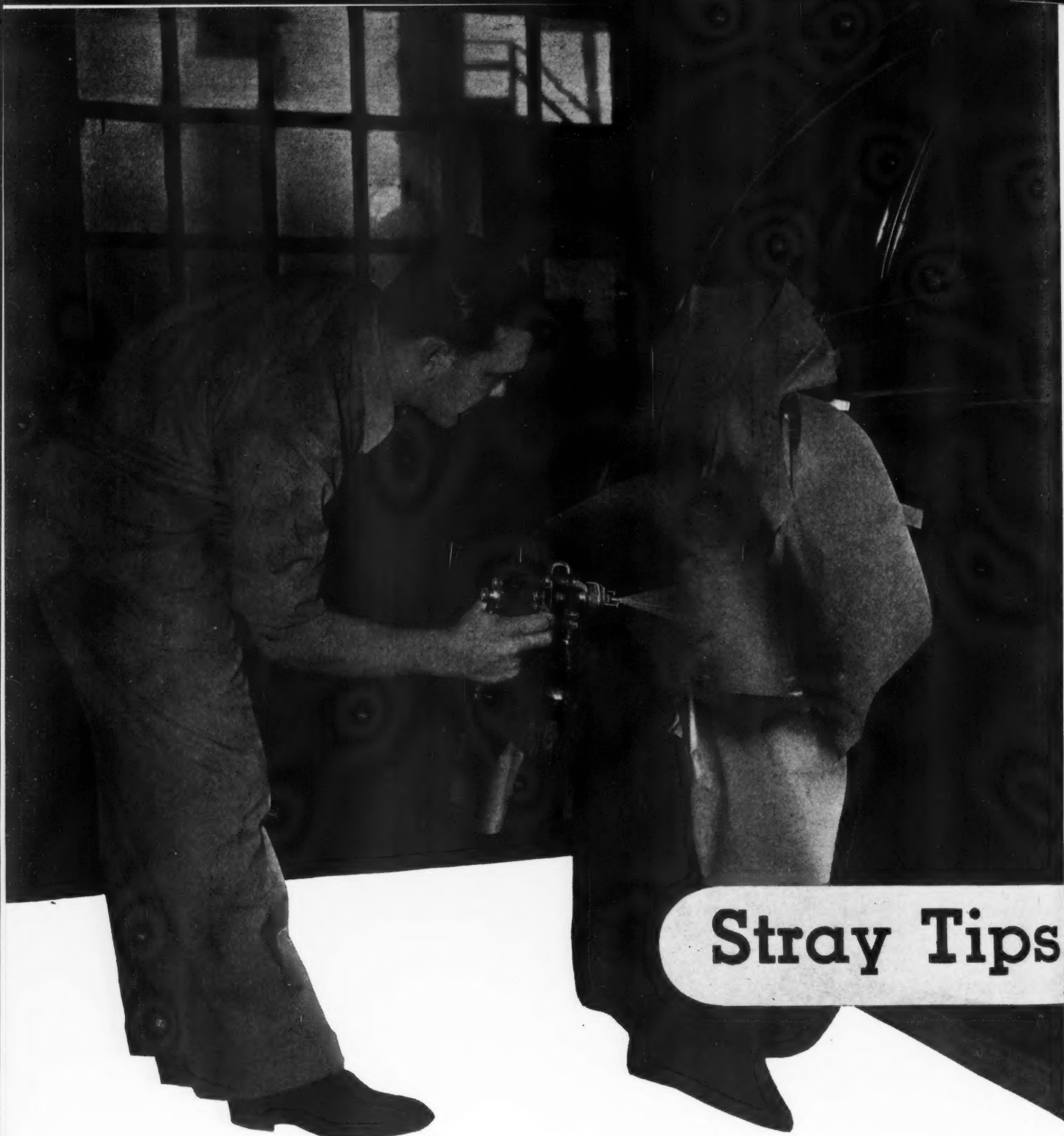
Fifteen thousand square feet of service area under one roof provides ample capacity for handling many service jobs at one time. Since service is the matter of supreme importance today, this is accented in all contacts with the public and is made the strong feature in advertising. The company feels that through giving quick efficient service at a time when careful workmanship and speed in getting cars back into use are more than ever important, it is building a strong group of patrons during the postwar period.

The business is departmentalized, with Albert (Bert) Reding, who has been servicing all makes of cars for

(Continued on page 74)



"Snow and ice, my eye! This is to hold my retread together!"



## Stray Tips

**A**S Pop O'Neill strolled across the shop on his way to the wash room, he saw Tommy Winters at work down in the body shop. That puzzled him because, so far as he could remember, he had never given Tommy any body work to do. His curiosity aroused, he walked down to get a closer look. Tommy was trying to spray paint a patched fender and, as Pop could see, not having too much luck.

Tommy pressed the trigger a second or two, inspected the work closely, then adjusted the gun. He was about to start painting again when Pop walked up beside him.

"Off the reservation, ain't you?" asked Pop.

Tommy swung around quickly with a perplexed look on his face.

"I mean bein' down here in the body shop, tryin' to do spray paintin'," Pop explained wryly.

Tommy shrugged. "Maybe I am. All I know is Larry told me to paint this fender while he finished up a brake job that has to go out this afternoon."

"Looks to me like you're all fouled up."

"There's something wrong with this gun," Tommy admitted frankly.

"Ain't it paintin' the right color?" asked Pop with a grin.

"Every time I paint, the finish is full of pinholes."

"Is that all?" asked Pop.

"Gee, that's enough."

Pop pulled at the lobe of an ear. "That's only one of



the little things you've got to worry about when you're spray paintin'. There's only one of two things that could cause pin-holin'. Either you ain't gettin' enough pressure to atomize the paint right, or else you're gettin' water in the air line. Let's take a look at the compressor."



Tommy laughed at the remark. "That's better," said Pop. "Now to get back to this paintin' business. When Larry told you it was easy, he was only tryin' to get outta doin' it himself. The fact is, spray paintin' takes a whole lot of skill. There's about a dozen ways of doin' it wrong, and a beginner can generally find 'em all."

He walked back to the car on

Tommy followed him over to the wall where the compressor stood, and saw that the gage read 55 lb.

"Pressure's okay," Pop said quickly. "Anything between 50 and 60 lb. will do. So the next thing is to look at the transformer."

Tommy's face went blank.

"That's a doohickey on the compressor," explained Pop. "It keeps the pressure up where you want it, and also gets rid of moisture and dirt in the air line."

"Then why—"

"Here's why," Pop indicated, cracking the drain valve. Tommy saw some water dribble out. "Water collects in the transformer and hasta be cleaned and drained regularly. I guess the boys have been too busy to do it."

Tommy shook his head. "Larry certainly gave me the wrong idea about spray painting. I thought all you had to do was press the trigger and watch the paint go on."

"Larry ought to be a salesman," Pop interjected. "With his line, he could sell jackasses in Maine and Vermont."

Tommy looked at him soberly. "That's a joke, son," cracked Pop. "Why don't you laugh?"

"You've been listening to Fred Allen on the radio."

"Okay," said Pop, "but didn't nobody ever tell you to always laugh at the boss's jokes?"

which Tommy had been working and took up the spray gun.

"I noticed you was holdin' the gun too far away from the work," he pointed out. "It's all right out here—" he held it about ten inches from the fender—"when you're usin' enamel. But for lacquer you've got to get closer—six or eight inches. Pop peered intently at Tommy.

"When you hold the gun too close, the finish 'll look like you was tryin' to paint the ocean—all waves. And if you don't hold it close enough, the finish 'll be pebbly.

"And," he went on, holding the gun at an acute angle, "you've got to be sure the gun is at right angles to the work. When you hold it like this you get a rough finish."

"Larry said to be sure," interrupted Tommy, "that the paint made a shape like an egg when it went on. But he didn't say why."

"That's the normal pattern made by the spray," said Pop. "And it's a mighty useful thing to know. When somethin' goes wrong with the gun, it shows up in the shape of the pattern and you can fix it quick.

"Say you start gettin' a salt-and-pepper effect and the pattern, instead of bein' nice and oval, is thin at one

(Continued on page 78)

## on Spray Painting

Painting can be easy if done properly, Pop O'Neill points out graphically in this 48th article of this popular Motor Age series



MOTOR AGE

BASIC COURSE FOR

MECHANICAL TRAINING

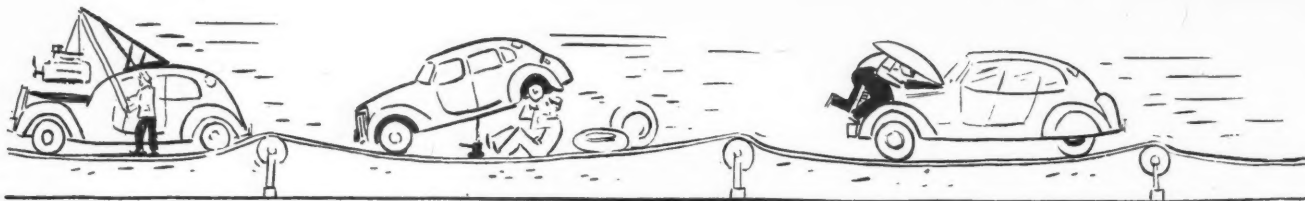
By J. EDWARD FORD

JANUARY, 1946

29

# They Streamlined Service

**Adoption of streamlined departments for more efficient and profitable service has boosted volume for this car dealer**



**S**TEADILY increasing service volume based on ideal location, direct mail, newspaper and radio advertising, plus huge facilities for service has made the Litsinger Motor Co., Chicago, Ill., one of the booming automotive shops in the middle west. Three moves, each location larger than the last, confirms the steady growth of business for this Chicago dealership.

Litsinger's has streamlined every phase of its large business, and is at present operating as efficiently as any huge auto factory in the country. Located on Washington Blvd., in the heart of Chicago, the site covers 50,000 square feet of ground alone. Well-planned departments, specializing in every type of automotive service and repair work, are housed in the large one-story building, including an engine rebuilding section and a complete parts service department. There is also a large basement storage room for large parts, engines, fenders, axles and other parts.

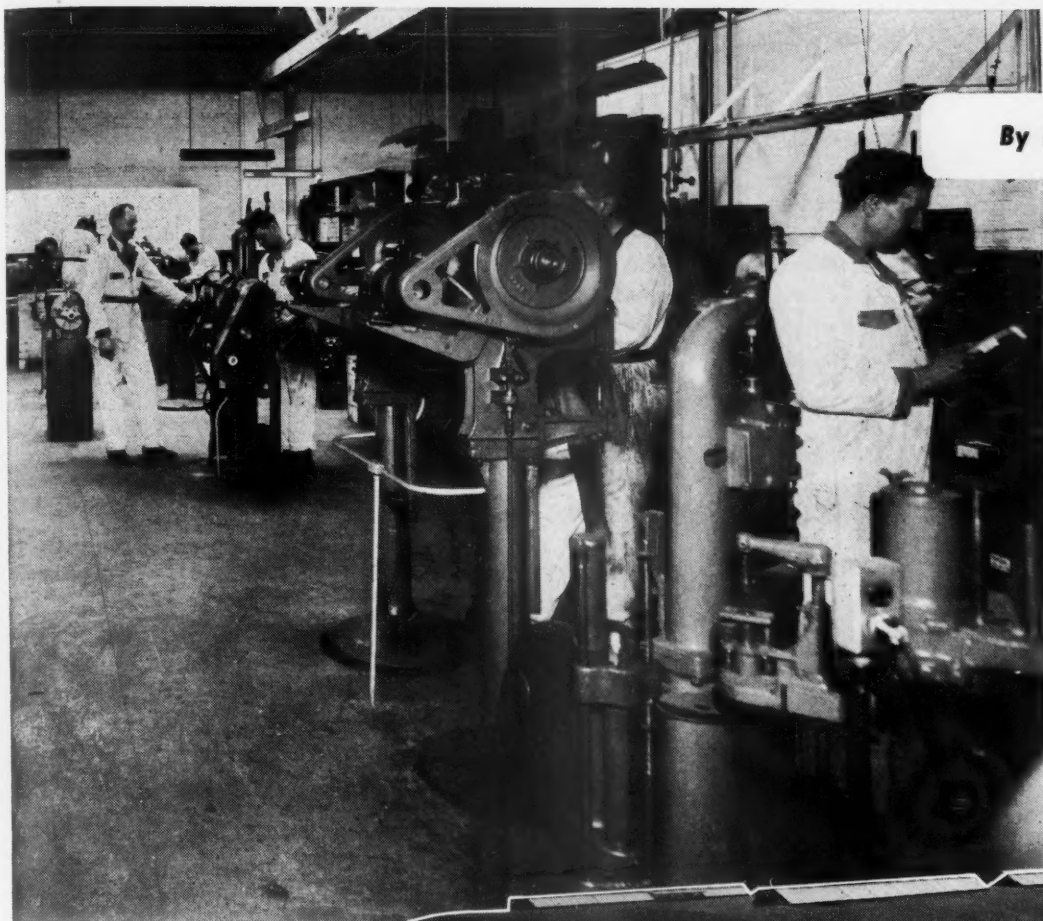


Fred R. Litsinger

During normal prewar years, the Litsinger company delivered an average of 2000 Ford cars and trucks per year. Recently, 4000 customers responded to a direct mail circular which the firm sent out. That's the way Litsinger's operate. Typical of many services offered to customers coming to this shop is the "packaged service plan" which has been featured for several years. The basic idea behind this plan is to offer customers a group of services at a price for the whole plan at a price less than the total of the group would be if each job were done individually. And actually, the idea saves the shop money and affords greater customer satisfaction which is extremely valuable.

Specially trained sales engineers bring in service jobs by making routine calls on fleet owners. These calls are timed with a contact and selling schedule gaged to fit the buying habits of each particular industry.

The Litsinger shop also holds bi-monthly service meet-



By B. M. IKERT



A view of the new Litsinger Motor Co. building, Chicago, Ill. Note easy access to building from all street approaches and large amount of window area.

ings for all service supervisors during which time new ideas are discussed along with cost reduction, service procedures and other allied subjects. To add interest to the meetings, door prizes are awarded at each gathering to lucky ticket holders.

But to get a better picture of Litsinger Motor Co., the men behind its policies, and its business structure, it is necessary to retrospect. The firm was first organized in 1920 by Edward R. Litsinger, and heading the management was Fred R. Litsinger. From its original small location at Archer and Leavitt Streets in Chicago, Litsinger's moved to larger quarters on West Jackson Blvd.

As car and truck sales mounted, and service volume increased, the dealership began to expand further, making its name known to hundreds of fleet owners and thousands of individual car owners.

When the production of the Ford Motor Co. was mobilized for war, Litsinger's started an engine and unit rebuilding program. Therefore entirely new departments had to be created to supply Ford Dealers in three states, to supply trucking concerns and fleet owners with rebuilt engines, carburetors, fuel pumps and other vitally needed

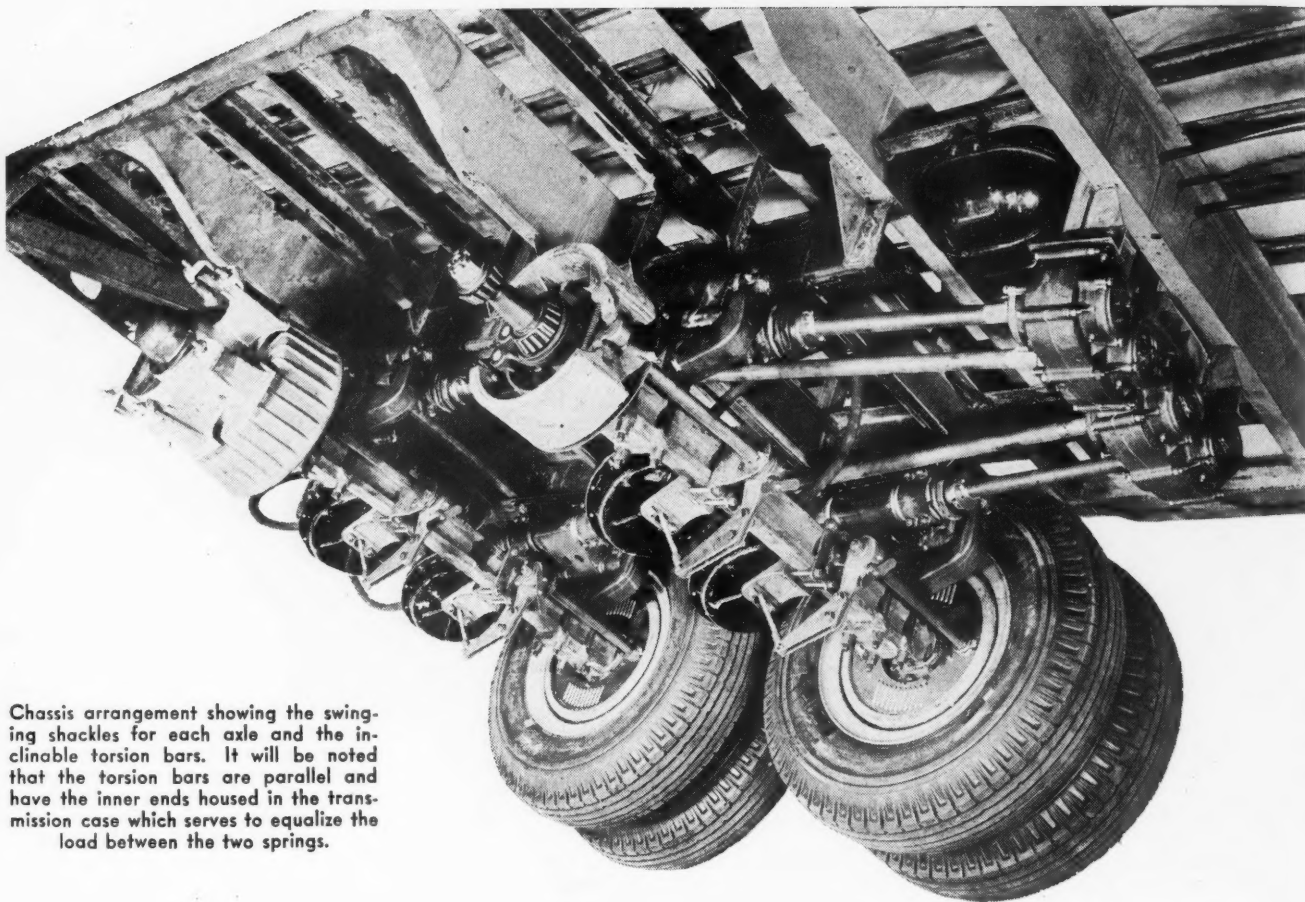
parts. It was a big order, but it was done.

Soon these new departments outgrew available space and because this vital work was necessary to the successful prosecution of the war, Litsinger's was granted permission to erect a new building on Washington Blvd., covering virtually an entire city block. Provisions were also included in the plans for future expansion up to 30,000 additional square feet.

The sales department at Litsinger's has the responsibility of direct product advertising. Most advertising is placed in local morning and evening newspapers. These were selected for reasons of quality, circulation and years of successful results. Radio advertising has been the latest venture of the company, and will probably be used to a greater extent when new cars make their appearance in

(Continued on page 82)





Chassis arrangement showing the swinging shackles for each axle and the inclinable torsion bars. It will be noted that the torsion bars are parallel and have the inner ends housed in the transmission case which serves to equalize the load between the two springs.

## Fruehauf Adopts New Suspension

**Gravity torsion bar suspension is  
adopted for use on Fruehauf trucks  
after period of extensive tests**

**M**ARKING the first departure from traditional methods of spring suspension for heavy duty motor vehicles, the Fruehauf Trailer Co., Detroit, Mich., has announced the adoption of its revolutionary system of "Gravity Torsion Bar Suspension" as standard equipment on its entire line of tandem axle trailers. An exclusive license for the use of this principle in trailers has been obtained from the Truck Equipment Co., holder of the basic patents.

Although the basic principle of the suspension system has been available for some time, its application to the Fruehauf line took considerable engineering design and experimentation before the change could be adopted and readied for production. A number of vehicles have been

in operation almost two years, under constant control, while a large number of new vehicles have been placed in operation in various regions more recently before the design was finally approved for fleet operators.

The suspension consists of longitudinal torsion bars, one for each axle, terminating in a mid-ships gear box forward of the front axle. This arrangement is the same on the right hand side. The rear ends of the torsion bars are fixed in the shackles. A feature of this design is the fact that the axles of the shackles and torsion bar are inclined toward the center of the chassis, thus imparting self-steering ability to the rear wheels.

The gear boxes contain a pair of one-to-one reduction gears for each side. Their function is to serve as a torque divider so as to load each torsion bar equally regardless of the movement of wheels on each side with respect to each other. Thus if one wheel deflects while the other is level, part of the torque on the one torsion bar will be transferred to the mating torsion bar so as to equalize the loading upon them.

From the standpoint of the fleet operator this new suspension system holds many features.

The axles have freedom of movement entirely independent of the frame and body. The entire load is suspended on the shackles permitting the cushioning of road shock both in the lateral and vertical directions. Lateral movement is so controlled that any tendency to tip the

*(Continued on page 86)*

MOTOR AGE  
**PICTURE**  
GALLERY

1946



Ushering in the New Year at Pasadena, California in the New Year's Day Tournament of Roses were Dorothy Deatherage, Alice Hathway, Miriam O'Keefe, Phyllis Carlson, and Toy Palaske. It looks like the year ahead will be a zestful one.

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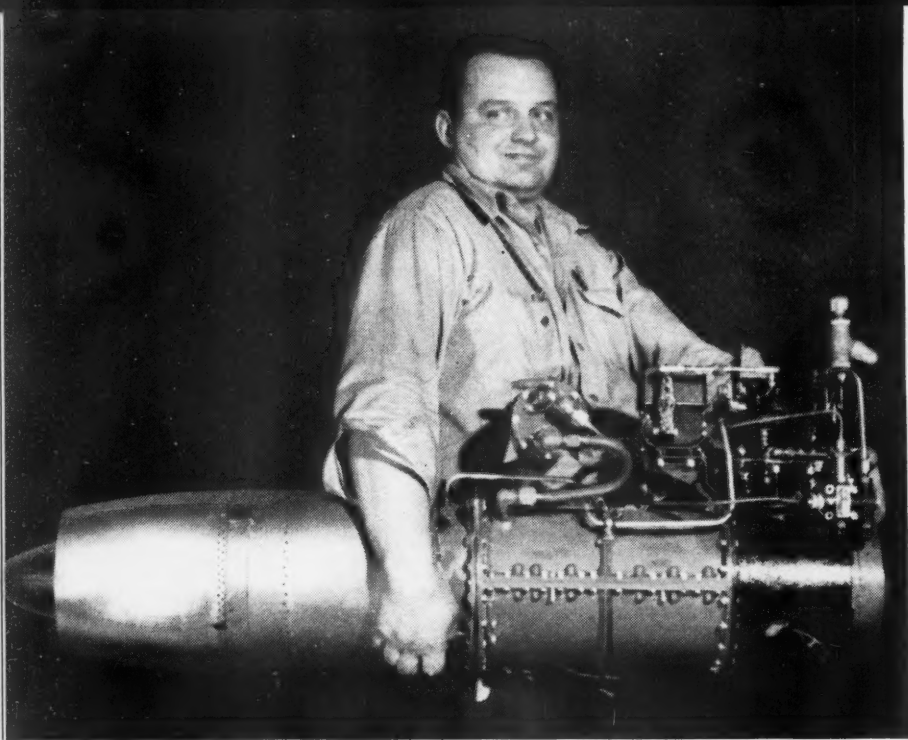
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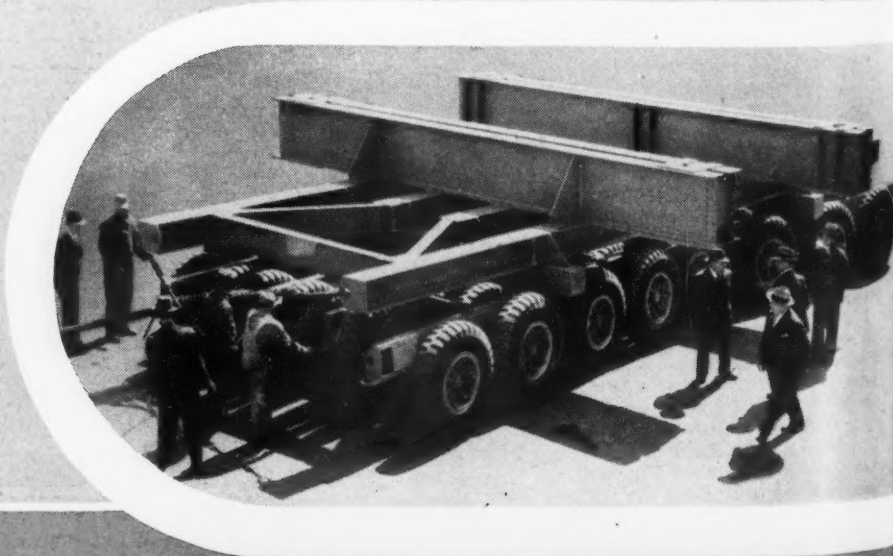


This "baby" jet engine, held by a technician at Westinghouse weighs only 145 pounds, and producing 275 horsepower, is slated for wide use in postwar projects. For the present, it will be used in aircraft cabin supercharging, wing de-icing, and also as power plants for private planes.



Howard Darrin, well-known designer of passenger cars, is shown completing final work on a model of the "Frazer", the new car being built by the Kaiser-Frazer Corp. The finished product is shown in the news section of this issue.

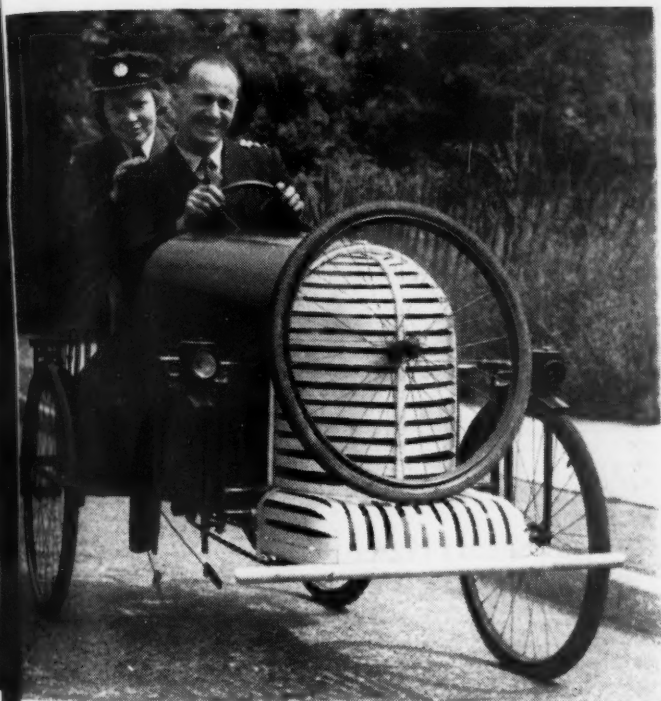
A flat tire here would produce an abundance of headaches. Said to be "the heaviest load ever moved on pneumatic tires", 300 tons of heavy equipment used for a military project is being moved on a 64 tire vehicle. The big tires are 18-ply, desert type made by the B. F. Goodrich Co.







Yes, this is a car, a racer, discovered at the Daimler-Benz Works at Stuttgart, Germany, and was designed to lower the straight-away record and reach a speed of 450 miles per hour. The vehicle has six wheels with engine in the rear.



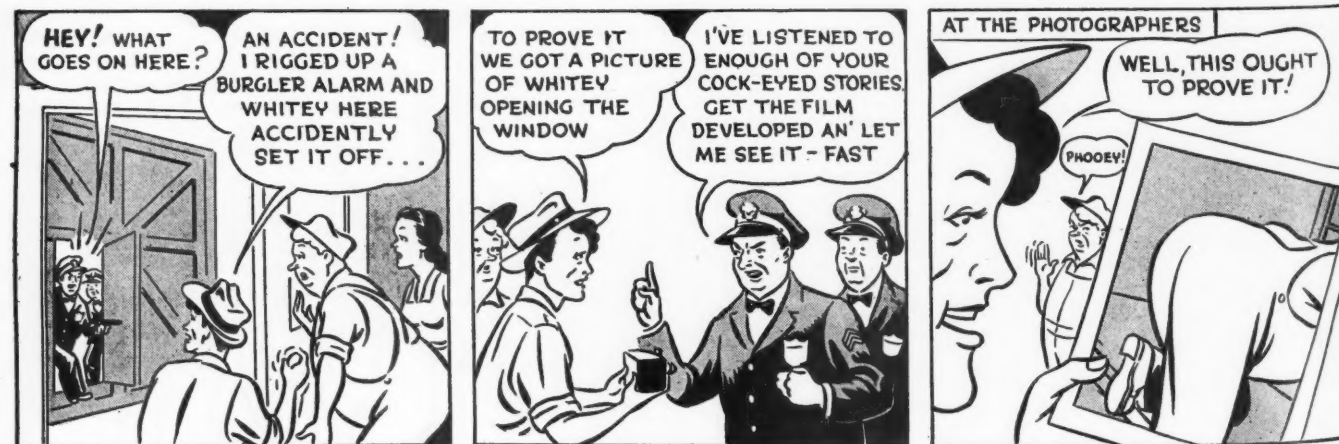
You've often heard of the fifth wheel in the wagon, well, the fourth wheel in this case also seems to be surplus. Owner Dande of Eastcote, England, has no trouble in pedaling along on three wheels. It has nine gears and the W.A.A.F. passenger is special equipment.

"Load the shootin' iron, Pappy! The revenoors are comin'!" This muzzle-loading rifle which belongs to another era is still being used by Hiram Harris, Jackson, Kentucky. Harris is loading up for a turkey shoot.



# FRANK THE FIXER

STORY BY J.E.FORD  
DRAWN BY A.L.CASSEL





# Check your Checks for Protection



By FRED W. AMANN

**A**UTOMOBILE dealers, garage owners and service station operators, can become victims of the fastest growing and most common crime in America. David Nigro, a car dealer in Melrose Park, Illinois, became aware of the spiraling figures that told of the losses caused by this crime, and sustained largely by businessmen like himself, when he became a victim of this racket some months ago.

This mounting wave of crime consists of that bug-a-boo, check forgery and check alteration. Mr. Nigro had first hand experience with one of those nimble-penned fellows who "work over" your checks (and collect, on a nation-wide scale, *seven million dollars a week!*) when one of his checks was deftly raised. It was successfully cashed for an amount much higher than he had originally written. Check writers, and safety paper are of course helpful, while insurance will provide full protection against such loss.

The national loss to individuals and business firms because of check alterations and forgeries show an alarming trend. In 1880, the annual loss from this crime was one and a half million dollars. This amount had risen in 1918 to thirty million dollars a year. By 1927, the loss to the nation's businessmen and ordinary bank depositors had increased to two hundred million dollars annually.

Insurance records show that up to 1942, the last year for which figures are available, the total yearly loss through forged and altered checks was over three hundred and fifty million dollars!

**Forgeries and check alterations costing shop operators  
and owners thousands every day can be easily eliminated**

Even national fire losses, compared with forgeries, are a second best. Fire burns up three hundred and fifteen million dollars a year. You would expect fire damage to exceed losses caused by forgery because you do not hear about forgeries. That is because they have not been ballyhooed and because, unlike fires, forgeries do not attract crowds.

When you write a check, the moment that check leaves your possession it begins a dangerous journey. It may pass through many hands, people you have never seen, whose reputations you do not know, who may be skilled in check alteration and forgery.

Supposedly routine correspondence is only one way whereby expert forgers obtain your signature. It can be easily copied, as you may have a chance to learn should a forgery, after managing to clear through the banks, make its appearance among your cancelled checks. And remember, banks are not held responsible by law for all forgery or check alteration losses occurring to their depositors even though the bank itself cashed the bogus check. You stand a better than good chance of being the sole loser!

(Continued on page 88)





### New Frazer Announced

This artist's preview of the new Frazer automobile (above) reveals the first American car designed with flowing front-to-rear fender lines. Features include increased visibility and extremely wide seating capacity. The new car has a wheelbase of 123½ inches and a specially designed 6-cylinder 100-horsepower engine. First peacetime product of Graham-Paige Motors, the medium-priced 1947 Frazer will be unveiled to the public in January as America's first all new automobile since the war.

### Ford Dealers Warned About 'Gray Market'

Ford Motor Co. dealers throughout the nation have been warned against participation in the so-called "gray market" in new cars, J. R. Davis, director of sales and advertising for the company announced.

Abuse of the informal and unofficial "priority systems" which have been set up to handle new car sales has reached serious proportions. Davis said, and various rackets are being worked to capitalize on the public hunger for new automobiles.

The abuses, he explained, range from name-switching on the unofficial priority lists to payment of fabulous bonuses for transfer of cars after they have left the dealers' hands. In many instances, Davis pointed out, the unfortunate victims of such swindles are veterans.

Three measures have been recommended for adoption by the Ford dealers to help minimize effects of the "gray market." They are:

"(1) No name substitution on dealer lists, and strict adherence to the first come, first served principle; (2) definite allocation of a proportion of all new cars obtained by dealers—from upwards of 25 per cent—to veterans, and (3) use of the now-abolished OPA priority lists to determine all debatable or borderline applications."

### Nash to Reenter Truck Field with Three Models

Nash Div. of Nash-Kelvinator Corp. will re-enter the truck field with three light trucks and will add an eight-cylinder passenger car to its 1947 line. The announcement was made by H. C. Doss, sales manager, at a dealer meeting in Detroit recently.

The new commercial line, first to be offered by the company since 1929, will consist of half-ton, three-quarter ton, and 1½ ton models. No details are available, since the trucks are not scheduled for introduction until next summer, probably July.

The eight-cylinder passenger car will augment Nash's low and medium price lines, represented by the 600 and the Ambassador respectively, to include an entry in a higher price range.

### Kelsey-Hayes Resumes Wheel Shipments

Upon the assurance from OPA that price ceilings on original truck components will be lifted soon, Kelsey-Hayes Wheel Co. has resumed shipment of wheels and other parts to its truck customers. The company suspended shipment several weeks ago to Ford, Chevrolet, International Harvester, GMC Truck & Coach, and others in protest against "unprofitable" prices set by OPA. As a result, Ford was forced to curtail truck schedules two-thirds.

### Chrysler to Feature Safety Engineering

Safety engineering will be featured on all models of 1946 Chrysler-built automobiles, K. T. Keller, the corporation's president, announced in a letter to stockholders. He also said that the organization plans to publicly announce its new lines in the near future.

Keller did not define the safety features to be incorporated in the new models, but he did point to the greater significance of safety engineering in the postwar manufacture of automobiles.

The executive also disclosed that the Corporation is spending approximately \$75,000,000 in new building construction and in restoring its plants to a pre-war condition for the production of cars and trucks. Eighty per cent of the task of clearing its plants of left-over war machinery and materials is completed, and 60 per cent of the thousands of claims from its vendors have been settled, he said.

"Chrysler Corporation's plans call for public announcement of new 1946 models for all its passenger car lines, Plymouth, Dodge, De Soto and Chrysler, in the near future," Keller continued. "The outstanding improvements to be found in all of these will not be listed now. Particularly important are certain mechanical features in the field of safety engineering which will be incorporated in all lines of cars produced by Chrysler."

### Kaiser-Frazer Selects West Coast Plant

Plans for expansion of manufacturing facilities of Kaiser-Frazer Corp. to the Pacific Coast and the selection of a California plant as the center of West Coast production operations were announced by Joseph W. Frazer, president.

Frazer, who returned from San Francisco, said that they have completed plans for Pacific Coast production of the medium-priced Frazer and the lower-priced Kaiser. Operations to convert the plant to automobile production will be started within a few weeks, he said.

Edgar Kaiser, oldest son of the famed shipbuilder, will be in charge of operations in the West.

Frazer said he could not divulge the location of the California plant immediately, but he said that the plant selected was an important producer of aircraft material during the war.

January, 1946

a b c d

## Four Front Wheels Steer on new Eisenhower Truck

A new type truck, designed for fast, long distance hauling, has been developed by the truck division of The Eisenhower Manufacturing Co. of Van Wert, Ohio.

The vehicle has a payload capacity of approximately 20 tons and is known as the Eisenhower Twin Engine truck.

Several new features in truck transportation are incorporated. These include what is believed to be the first successful application of four front steering wheels for commercial use, which make possible greater load capacity through better distribution.

Easier steering is accomplished through the use of four front wheels in tandem relation rather than dual relation. The truck has three rear axles, including two driving or "live" axles, with a "dead" axle between. Dual wheels are on all three rear axles, and singles on the two front axles.

Overall length of the truck is 35 feet with a truck bed of 25 feet, meeting length regulations for highways in practically all states. Because of the flexible type of suspension, the frame remains level and does not rack.

The truck is powered by two standard make 93 horsepower motors mounted in line. One is under the hood, and the other motor beneath the cab. The front motor is directly connected to the front rear axle, and the rear motor to the rear-most axle. The motors can be used together or independently. The power selection can be made at the will of the driver at any road speed while in any gear.

Standard 1½ ton truck parts are used throughout with the exception of the frame and suspension. Standard motors, clutches, transmissions, differentials, axles, wheels, etc., facilitate easy servicing and repair when necessary.

## Willys Wins Trade Mark On "Jeep" in England

Willys-Overland Motors has been issued a British trade mark registration on the word "Jeep", it was announced.

The trade mark certificate of registration was issued to the company on December 1, and provides Willys with the prima facie right to market motor vehicles in England under the trade mark "Jeep".



This illustration shows the four front-steering wheels, one of the features of the new twin engine truck developed by the Eisenhower Manufacturing Co., Van Wert, Ohio.

## Pontiac Ships 1946 Models to 3000 Dealers

In twenty-one working days, Pontiac Motor Division has built and shipped 1946 models to each of its 3000 dealerships, D. U. Bathrick, general sales manager reported.

Pontiac distributed its new models impartially across the country without regard to the size or location of dealerships. Thus 1946 Pontiacs were on display in towns of 5000 population as soon as they were in New York, Chicago, and Los Angeles.

"Supplying the metropolitan centers at the expense of the smaller cities was a merchandising pitfall we were determined to avoid," Mr. Bathrick said. "A fair distribution policy demanded, in our opinion, that all dealers be supplied at the same time and not just the 'prestige points' and 'glamour centers.' Hundreds of telegrams from our dealers have conveyed their appreciation of this method of working out an unusual situation."

## NADA Directors Meeting In Chicago January

The annual meeting of the board of directors of NADA will be held in Chicago, Stevens Hotel, January 29th and 30, it was announced. The last meeting of the present Executive Committee will be held on Monday, January 28th, and the first meeting of the new Committee will be held on January 31st.

## Auto-Lite Co. Opens School for Servicemen

Automotive electric servicemen from many sections of the world will soon begin gathering for special schooling at The Electric Auto-Lite Co. in Toledo, Ohio, it was revealed by Royce G. Martin, president. The first training school since the beginning of hostilities will open January 7.

The school, which will be directed by H. B. Hewitt, director of education for Auto-Lite, is designed for the practical training of automotive electrical service men of Auto-Lite distributors and service stations with vehicle service facilities holding Auto-Lite franchises.

In physical makeup, the school is a model automotive service station providing shop facilities for the analyzing of engine performance and the testing and servicing of various equipment.

## DeVilbiss Schedules Two Spray Painting Courses

Two one-week courses in the first half of the 1946 school of spray painting conducted by The DeVilbiss Co., Toledo, Ohio, will be devoted to auto refinishers. Free to users of DeVilbiss spray painting equipment, these courses will be identical in classroom instruction and shop work. Scheduled starting dates are February 11th and May 13th.

DeVilbiss urges auto refinishers interested to write for reservations at least two weeks in advance of either session.



MOTOR AGE For January, 1946

### Col. J. G. Vincent Named Director of Packard Co.

Election of Col. Jesse G. Vincent, 65, vice president in charge of engineering at the Packard Motor Car Co. since 1915, to the board of directors was announced recently by Alvan Macauley, board chairman.

Vincent, who joined Packard in 1912 as chief engineer, succeeds the late Truman H. Newberry, who died last October 3 after serving as director since the company's incorporation in 1903.

Macauley said Vincent would also remain in active charge of Packard engineering. Other members of the board, besides Macauley and Vincent, are Henry E. Bodman, Joseph M. Dodge, James T. McMillan, Robert B. Parker and Geo. T. Christopher, president and general manager of the company.

### UAP Enters the Hydraulic Jack Field

Carrol E. Gray Jr., chairman of the board of United Aircraft Products, Inc., aeronautical manufacturers and engineers, announced the entry of the company into the hydraulic jack field covering every phase from automotive and utility jacks to aviation, railroad and industrial jacks.

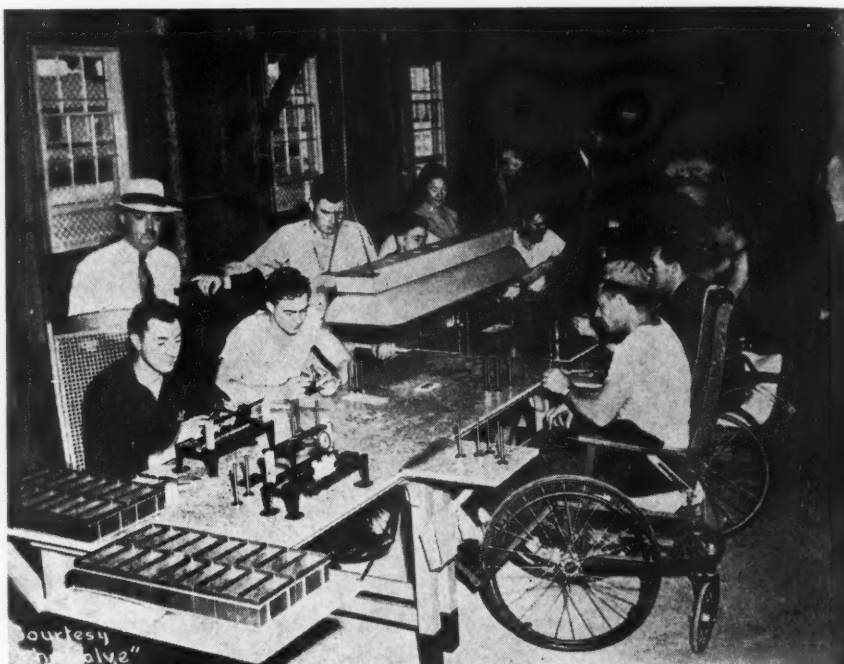
Production is in progress at both the Dayton and Los Angeles plants of a full line of hydraulic jacks for passenger cars, trucks and buses as well as a range of patented "quick-contact" hydraulic four-wheel jacks for garages, service stations and factories. The "quick-contact" hydraulic jacks are being marketed under the tradename of "Ski High."

### Chrysler Introduces New Hydraulic Brake

A new type hydraulic brake providing increased braking power and greater safety has been developed by Chrysler Corp.

Engineered tests have indicated increased braking effectiveness of these new brakes of between 33 and 40 per cent it was stated; a reduction in foot pedal effort required of from 25 to 30 per cent; and substantially increased brake lining life.

This new brake will be installed as standard equipment on all 1946 Plymouth, Dodge, De Soto and Chrysler passenger cars.



Disabled Veterans at the Percy Jones General hospital annex, Ft. Custer, Mich., are learning to do precision industrial inspection work and are being paid for their time. It is part of the rehabilitation program conducted at the hospital with the cooperation of the Federal Products Corp.

### Disabled Veterans Learn Industrial Inspection Work

VETERANS of World War II, although seriously disabled in Uncle Sam's service, are already on the road to economic rehabilitation, thanks to the use of precision measuring instruments made by Federal Products Corp., Providence, R. I., a concern which pioneered in this field.

The disabled veterans are wheel chair patients at "Valor," a unique plant, located at the Percy Jones General Hospital Annex, Fort Custer, Michigan. The plant is complete with gages, indicators, comparators, and the latest fluorescent lighting system.

In this new plant these men who have suffered severe spinal injuries, learn to become industrial inspectors in a very short time.

At "Valor," a name which by the way is taken from Vocational Activities Liaison of Rehabilitation, these inspectors-to-be, work for two hours in the morning and two in the afternoon. The "Vets" use regular time cards and, of course, receive pay checks from the Eaton Manufacturing Co. for all work done during their

training period. The veterans have responded enthusiastically to the opportunity to thus fit themselves for precise work as industrial inspectors. As one official puts it:

"Just to see the fellows brighten up, to be cheerful and busy again is worth every effort that has been expended."

Specially constructed inspection benches enable the servicemen to get their wheel chairs up close to the instruments and thus keep fatigue down to a minimum.

By making use of modern dial indicating gages for inspection work the men can become proficient in industrial inspection in very much shorter time than they would be able to do without such instruments. It is not necessary for the men to develop a fine sense of "feel" such as is called for when for instance micrometers are used for inspection work.

This successful experiment is a noteworthy example of how scientific development in the art of gaging is already used in the cause of peace, and the rehabilitation of disabled service men!



# Butyl Tubes Prove Successful

Butyl tubes emerge from the war as a successful postwar product with many advantages

over tubes of natural rubber and will be made available for wide use in coming new tires

**O**URS is a scientific age. We are constantly replacing conventional materials with synthetic products. Some of the "substitutions," particularly those made during the war, are merely stop-gaps: they are used because the desirable product is scarce or unavailable. But here and there industry has developed synthetic products far superior to the natural materials they replaced.

Such is the case—according to the experts—with Butyl rubber. Known technically as GR-I (Butyl), it is a material which displaced rubber in the inner tubes of tires for military vehicles. The demand for Butyl has been so great during the war that none of it was available for civilian use. Civilians have had to be content with serviceable synthetics such as GR-S (Buna) which does not compare with Butyl for inner tubes. That's something to bear in mind when you attempt to appraise the virtues of synthetics.

In any event, Butyl has done so well on military vehicles that the tire experts are convinced it is superior to natural rubber and should be the standard inner tube material for all postwar manufacture. However, the tire people have learned a great deal from their war-time experience and tell us that the present product will be subject to considerable improvement.

Unlike some of the other synthetic products introduced in recent years, Butyl is exclusively an American development. It grew out of work done by chemists of the Standard Oil Co. of New Jersey in their search—as far back as 1932—for additives or blending agents for lubricating oil. The basic material comes almost entirely from one of the refinery gases that go into the making of aviation gasoline. Since this gas is known as "isobutylene," the chemists decided to call the end product—Butyl.

The experimental rubber was compounded by combining butadiene with the isobutylene, the combination being called polymerization by the chemist. Later research showed that better results would be obtained by using isoprene, a chemical relative of butadiene. The new combination produces a much better rubber. One of the peculiar things about compounding Butyl rubber is that the process takes place at sub-zero temperature. This in itself made the job of producing rubber quite difficult because of the mechanical problems of operating machinery, keeping packings tight, and maintaining lubrication under tem-

peratures colder than we find them at the North Pole or in the stratosphere.

In 1941 Standard Oil began the construction of its first full-scale Butyl rubber plant—with its own funds—in Baton Rouge for its Louisiana division. Although Butyl did not attain full commercial production until March, 1943, in March 1942, Standard Oil, realizing the possibilities of the process, agreed to license anyone interested in the production of Butyl rubber during the war without royalty, and after the war at reasonable royalties to be fixed by the government.

Butyl rubber is neither a cure-all nor a substitute for natural rubber for all purposes. Fact of the matter is, it is limited to certain specific applications at this writing. The inner tube is one of the major items.

According to Standard Oil, tubes made of Butyl are as durable as natural rubber if not more so. They hold air ten times longer. That implies that they need inflating only four or five times a year. This is not so important as the fact that by holding air better, the Butyl tube increases the life of the tire and helps to improve fuel consumption by preventing tire pressure from dropping below a safe level. It is claimed too, that the Butyl tube

(Continued on page 94)



"Can you remove it without surgery?"

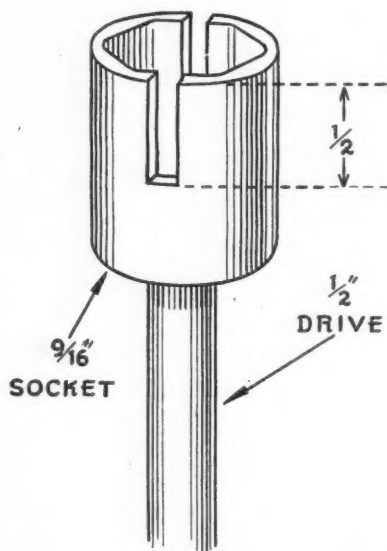
Here's your chance to pick up a little extra money. We'll pay five bucks (\$5.00) for every Shop Kink accepted and printed. So send 'em in to us—some short cut you use in doing a job easier and faster than the other fellow—some special tool you made when you couldn't buy one to do the job—and we'll do the rest. Incidentally we won't accept any that have previously appeared in any other automotive publication. Send 'em in!

# SHOP

## Petcock Removal Tool

Here is an easy way to make a tool to take petcocks out to drain the water jacket on Chrysler products.

Take a 9/16 (6 point socket) half-inch drive, cut a slot crossways so it will slip over the wing on the petcock. —William H. Stredwick, 2124 E. 26th St., Vancouver, Wash.



## Prevents Hammer Slip

To make hammers easier to hold when hand is greasy or wet from perspiration, groove handle with XX on the corner of an emery wheel. —J. T. Johnson, Box 251, Alpine, Texas.

## Replacing Starter Switch

Quite often I have to replace a starter switch while the starter is on the car. It is easy to get the old switch off, but to replace a new one is very difficult. To put the back screw in, which holds the switch, is hard because of the angle from which it has to be started, and also being so close to the block.

To make this job easier, cut the inside hole in starter switch outward with a pair of cotter key cutters, or hack saw. First place screw in starter switch hole in the starter next to block. By using a little grease to hold lock washer to top of screw, the switch can be slipped under washer and screw and then easily tightened with a short screw driver. The second screw, of course, is easy to install. —H. S. Moates, J. J. Moates Auto Co., Andalusia, Ala.

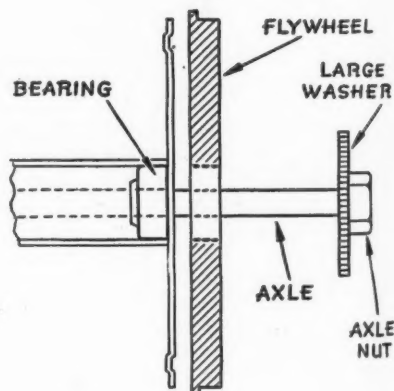
## Rubber Band Saves Time

About 1 to 1½ hours of labor can be saved on Borg-Warner type overdrive used on Chrysler Products, Nash-Studebaker, and others, when replacing noisy gears. By loosening the shaft flange nut and housing bolts and pulling the housing off the shaft, leaving about ½ the mechanism still in place this can be done.

Only difficulty is that the over-running clutch rollers fall out, and can't be reassembled. To overcome this, you install them in place with a rubber band, slip the housing back on and run the car so the rubber band will be chewed up and dissolved in the lubricant. —William Delach, 115 45th St., Pittsburgh 1, Pa.

## Semi-Floating Axle Removal

A very sure way to remove a semi-floating axle when the bearing insists on sticking is by taking a Chevrolet or other similar flywheel, and slipping on the axle. Then replace axle nut with large washer inside. Give a quick pull so as the weight of the flywheel will act as a hammer. —Reuben Newman, Mead, Colo.



## Starter Repair

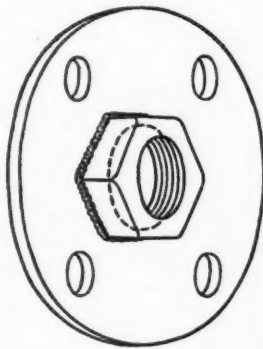
Quite often Chevrolets and Pontiacs come into the shop with bad operating starters. The starter pedal has to be pressed hard to make contact because the starter drive strikes the end of the housing which keeps the starter switch from making good contact, and in some cases, no contact at all. To correct this trouble take a new switch and solder a 5/16 flat washer on the starter switch button. This will stop the starter drive about ⅓ in. from housing, thus making starter perform better due to better contact of starter switch. —H. J. Moates, J. J. Moates Auto Co., Andalusia, Ala.

# KINKS

# \$5

## Fan Pulley Tool

Here is a sketch of a 1937-1942 Chevrolet water pump, and fan pulley puller that can be made in any garage. It will serve the purpose very well as I have made one for my shop and it does the work satisfactorily.—*C. B. Belk, Oxford, Miss.*

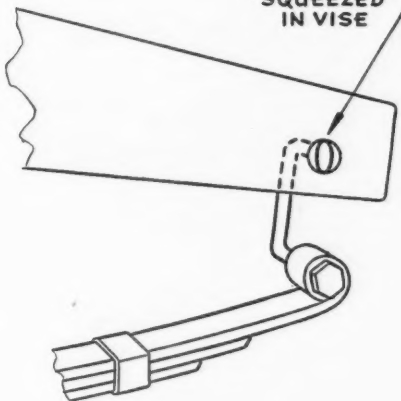


5/16 x 2 IN.



9/16 x 2 IN.

BUSHING  
SQUEEZED  
IN VISE



## U-Shackle Bushing Repair

The following is a cure for those "self-unscrewing" silent U-shackle bushings. All that needs to be done is to heat the bushing, and then squeeze it slightly flat in a vise. The shackle will then ride in the top or bottom of the hole. The open end of the bushing should not be squeezed too much as it might make it hard to enter, and the amount of the "squeeze" depends upon the wear in the frame or spring.—*A. W. Bughund, Duluth, Minn.*

## Brake Cable Installation

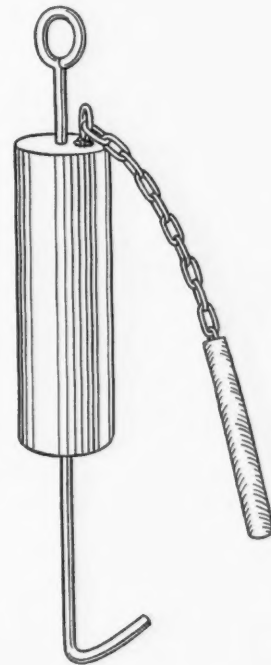
I have found an easy method of hooking emergency brake cables on all General Motors cars and some other makes also.

Simply press the foot brake and hold down, which relieves the tension from the cables, and allows one to slide the pins in easily. Care must be taken that wheels are free when brake is released.—*Archie Evans, Evans Garage, Cornish, Me.*

## Clogged Breather Tool

Clogged breathers on Chevrolets are a frequent cause of oil loss through the front or rear main bearing. These are usually tight and awkward to remove when cleaning is required.

A sliding hammer with a hook on one end, and a ring on the other side



## Repair Aid

I find it saves time, also quite handy, when grinding valves and replacing rings with the motor on a stand. Take your clutch lining shaft, and weld a 1/2 in. drive socket on the outer end. You can use your flex bar in turning the motor over which is very easy.—*H. L. Van Horn, Yakima, Wash.*

makes this job easy. A foot of chain welded to the sliding hammer makes operation easier. The tool is hooked under the crotch of the oil filler tube, and held by the ring with one hand while the hammer is operated by pulling on the chain.—*John Doll, Rocky Ford, Colo.*





# NEW

## Radiator Specialty Co. Announces New Products

The Radiator Specialty Co., Charlotte, N. C., manufacturers of "Tite-Seal," and other solder Seal products has announced the development of two new products ready for distribution to their jobbers. The new products are manufactured under the trade names of "Water Pump Lubricant and Anti-Rust," which is a specially prepared soluble oil for lubricating water pump bearings and seals. It contains, in addition, an anti-rust ingredient preventing the formation of sludge, rust and scale. In new cars it is merely added to the cooling system and it works with any reliable anti-freeze solution.

The second product is known as "Super Solvent, Auto Cooling System Cleanser," which completely dissolves all rust, scale and sludge into a thin watery solution which flushes out as easily as water.

It is safe to use and none of its ingredients is harmful to rubber hose, pump packings or delicate metal parts.

## New Type Aluminum Bicycle Engine

A new type all-aluminum bicycle engine has been made by Reynolds Metals Co., Louisville, Ky.

Weighing 32 pounds, the two-cycle, mechanical valve engine develops approximately two horsepower and is capable of driving the average bicycle at speeds up to 35 miles per hour.

Two patented features, an inverted installation and a direct friction drive on the rear wheel, make for a more easily operated, simpler, more compact "motor bike." The engine, which fits all standard bicycles, is held in place by three clamps on the rear fork and is easily installed in a couple of hours. The clutch, choke and throttle are conveniently located on the handle grip operating by means of cable controls.



## New Clamp Developed

A C-Clamp with quick acting Bar-Lok has been developed by the Mechanics Engineering Co., Box 243, Jackson, Michigan. The clamp has an optional equipment, a detachable shield to protect the holding unit against spatter when the tool is used on welding work. The clamp, which is precision built for medium duty jobs is made in several sizes. A circular containing specifications will be sent free on request.

## Zoo Master Gun

The new type ZOO master gun attaches to any standard air and water lines and is easily operated by one man. It is well balanced for instant water and air regulation. The self-holding, screw-type adapter fits all sizes of radiator hose ranging from 1 to 2 inch diameters, and when used with the 30 inch rubber hose makes flushing of the auto cooling system a simple task, especially on the cars where there is a limited space around the lower radiator or clothing of the operator during car flushing. By inserting the adapter extension into the heater hose, reverse flushing of the car heater is easily accomplished. The same adapter connection is also used to reverse flush the block.

## New Tool Utilizes Hack Saw Blades

Designed to cut down the discard of broken lengths of hack saw blades, the Super Blade Holder distributed by A. D. McBurney, 939 West Sixth St., Los Angeles 14, Calif., also accommodates thin flat file sections.

It is a single unit tool composed of a tubular handle with an extended positive grip nose for securing the working point of the blade or file. The ends of the handle are slotted to receive inserted blades. Almost any length blade can be held securely.

The "Super" simplifies many operations such as key-hole sawing and is perfectly suited for tool and die makers. Price of the Super is 95 cents.

## Aircraft-type Terminal

A new aircraft-type solderless terminal is offered by Standard Motor Products, Inc., of Long Island City, N. Y.

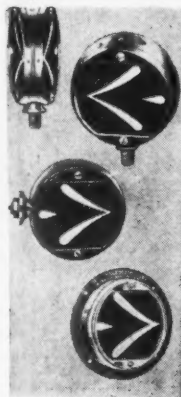
The Standard aircraft-type solder-



less terminal is made of extra heavy gage copper, tin-plated to protect against corrosion and grips the insulation as well as the wire itself. These terminals are available through automotive parts distributors in kit form or in individual numbers.

# PRODUCTS

## Four Types Safety Signal Lamps Announced



The Teleoptic Co. of Racine, Wis., manufacturers of directional signal lights announce four types of heavy duty lamps to meet the demand for safety signal protection on both commercial and passenger vehicles. These signal lights, which flash a di-

rection warning before every turn of the vehicle, are described as providing 180 degrees visibility 125 feet day or night from front, rear or sides. Three types of control are now available, finger-flip switch on end of gear shift lever, bracket switch mounted on steering column and instrument panel board switch, with or without pilot light.

Teleoptic is now also manufacturing the "Fog King" and "Road King" fog and driving lights.

For further details write The Teleoptic Co., 1251 Mound Ave., Racine, Wis.

## Corrosion Eliminator Compound on Market

The Noco Co., 2074 E. 65th St., Cleveland, Ohio, are continuing to market their Battery Corrosion Eliminator.

The corrosion eliminator is packaged in jars, and each jar of part number 201 contains two terminal protectors and 2 oz. of battery corrosion proof compound eliminator. It is claimed by the manufacturers that Battery Corrosion Eliminator saves battery cables, battery carriers, wiring and burned out headlight bulbs due to cables eaten away and loose connections.

## New Niehoff Metal Cabinets Announced

C. E. Niehoff & Co., 4925 Lawrence Ave., Chicago 30, Ill., is now offering automotive service shops, 3 major service stocks in metal cabinets. This system of stock control is said to save time locating ignition parts, cuts, inventory losses, eliminate errors in ordering and speed up sales and service. One code covers all ignition systems.



Cabinet is of welded construction with high enamel finish, and comes completely set up. Sections can be added as needed. Write C. E. Niehoff & Co., for illustrated literature in colors.

## Waterproofing Product

The General Detroit Corporation, 2272 E. Jefferson Ave., Detroit, Mich., announces the development of a new product, Wetstart, which eliminates automotive troubles caused by moisture. Wetstart is designed to make ignition systems waterproof, to restore and protect insulation on wiring, to retard battery corrosion, and to give from six months to two years' protection with a single application.

## Miniature Inspection Lamp Announced

A new miniature inspection lamp, the Eder-Lite, now makes it possible for inspectors, engineers, mechanics, scientists and others whose work requires inspection of hard-to-get-at places, to light up and visually inspect cylinders, gear housings, tubes, rifle barrels, pipes and other equipment that has openings as small as 5/16 of an inch and recessing interiors.

The standard Eder-Lite set comes in an attractive velvet lined leatherette case. It consists of a built-in push button type transformer lamp handle constructed for A.C. current, a ten-foot plug-in cord, two rigid and two flexible extensions of varying length that can be used in combination or separately, and four screw-in miniature tungsten bulbs of varying sizes.

For a completely descriptive folder about the new Eder-Lite write to Harmon and Co., 6 N. Michigan Ave., Chicago 2, Ill.

## New Improvements in Saw-Gun Announced

New improvements have been made in the appearance and mechanical operation of the Saw-Gun, a portable power saw and file which is propelled by electricity, air or flexible shaft. Ordinary hack-saw blade or file fits into holder.

According to the manufacturer, the improvements include a streamlined housing which is highly polished and of perfect balance. A tabular, ribbed



hand-grip is built into the housing which remains cool even after hours of continuous operation. It is claimed that a built-in grip of this type allows greater accessibility to out-of-the-way places. A pistol-grip, detachable handle is provided as standard equipment, and may be used by the operator if considered more convenient.

The Saw-Gun may be purchased complete with specially geared, all-purpose drill for \$92.50. Saw-Gun only may be purchased ready for attachment to electric drill, air drill or flexible shaft for \$47.50. The Saw-Gun is also packaged complete with pistol-type air drill for \$91.00. Complete information may be obtained from Mid-States Equipment Corp. (Saw-Gun Division), 2533 East 73rd St., Chicago 49, Ill.



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# CLEARING HOUSE

## FOR SERVICEMEN'S QUERIES

Bill Toboldt, Editor, Motor Age

### Point Installation

Can you give me the proper procedure for point installation on the Oldsmobile 40-41, also Buick 39-41?

I would especially like information on sequence, and method of attaching condenser leadwire, and on stationary and moving points.—Clarence Grieg, Iron River, Mich.

THE easiest method of installing breaker points on both the Olds and Buick distributors is to remove the stationary and removable points as an assembly. This can be done by taking out the single hold-down screw. The wires are then detached and the new points installed on the plate. The wires are then connected and the assembly reinstalled in the distributor.

In regard to the condenser, this has rather a long lead which goes around the edge of the distributor housing. If you are using a replacement condenser on the outside of the distributor, the lead, or pig-tail should be connected to the primary ignition terminal on the side of the distributor housing.

### Bearing Inserts Chipping

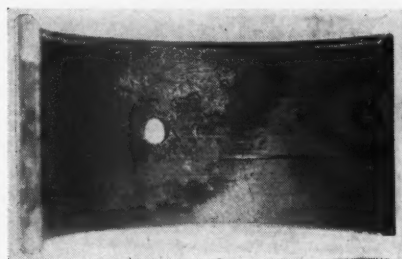
What is the chief cause of connecting rod bearing inserts chipping out, or breaking loose some of the bearing surface from its steel backing? I have noticed this condition on many overhaul jobs, especially Plymouths and International trucks and a few others.

Is this caused by water in the oil, and then freezing, or is it due to some neglect in caring for the motor, or is it just natural for some motors in this regard than others. In this way, I believe the old spun-in type of brazing was superior to the insert type of construction. What is your opinion?—Elmer Weiwoide, Mantado, N. D.

THERE are several reasons why the bearing material breaks away from its steel backing, and the main reason

is lack of sufficient or proper lubrication.

During the war, when many engines because of rationing were operated for short distances only, and con-



sequently got warm, an acid sludge was formed in the crankcase. This would attack the bearing surface, and in a relatively short time, the bearing material would flake off. Of course, if engines were heavily over-loaded, the same effect would often result.

### False Amp. Reading

I am having a little argument with a friend and would like to obtain correct information on the following subject. I installed a double relay for Sealed Beam headlights on a '39 V8 Ford. Before installing it, the ammeter showed a discharge of about 10 amps on brights. After installing the relays, it only showed about 2 amps. discharge. I claim this is a false reading. Please advise me on this.—E. Hanson, Chicago, Ill.

YOU are quite correct in saying that the discharge of the two Amp. on this headlight circuit is a false reading.

When you install the headlight relays, the current operating the headlights no longer passes through the ammeter. Consequently, the reading of two Amp. is the current drawn by the resistance of the wires operating the relay.

### Gear Pump Query

On a gear pump that pumps with two gears, water or oil. Does the fluid go through the gears, or at the end of the gears? I would appreciate your reply on this question which seems to be a puzzler.—Ray Duley, Dexter, Mo.

ON gear pumps such as are used for pumping oil in an automobile engine, the oil passes through the gears to the bearings. I trust this explanation will answer your question.

### Free Wheeling Lock Out

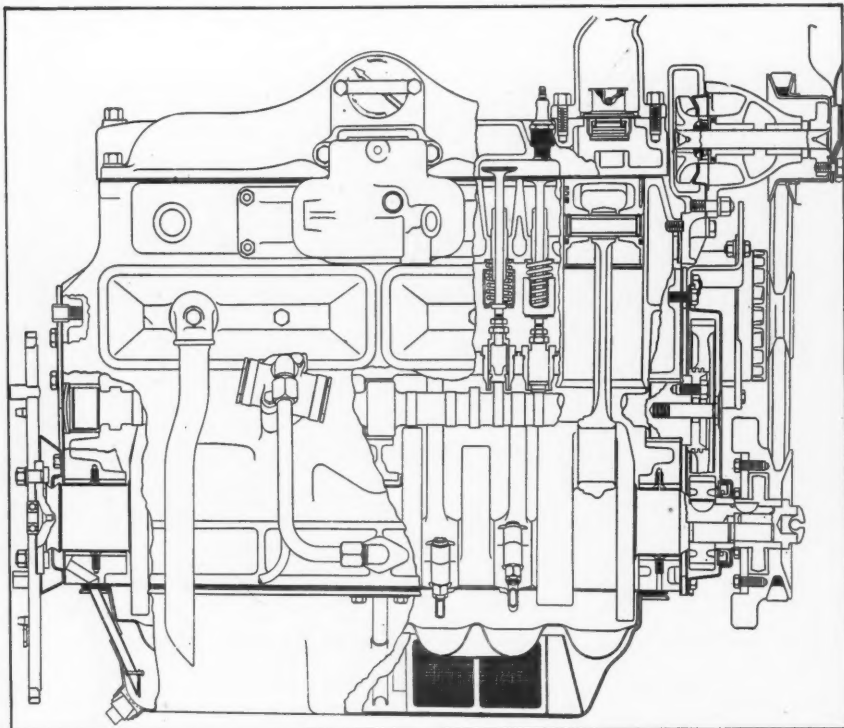
I would like to know the procedure for removal or locking out of the free wheeling, and at the same time leaving overdrive operative on the 1936 C-3 Chrysler Deluze Airstream Eight.—Rapp Garage, Marion, S. D.

TO lock out a free wheel unit on a 1936 Chrysler, the easiest method is to simply wire the operating lever on the side of the free wheel housing so that it cannot move.

### Oil Consumption

We would like to know if you could be of assistance in helping us to solve the following problem. About a year ago, one of our customers came to us with a 1939 Ford "60" that was using oil excessively. We rebuilt the motor which did not help much, have torn it down several times, trying to find the cause. At present, the motor has had new bearings on crankshaft which was reground. At the last check of this motor, the compression is up to factory specifications, and it is forcing approximately 1 quart of oil out through the crankcase ventilator every 150 miles. There are no oil leaks on this motor at all.

What we would like to know is what causes the oil to escape as fumes



through the ventilator, as it cannot be blow-by from the pistons with compression upon all cylinders.

Any information you could give us would be greatly appreciated.—Fred Lamb, Lamb Brothers Garage, Saginaw, Mich.

**I**N spite of the fact that you have installed new sleeves, and new bearings on the 1939 Ford "60," there has been some slip up somewhere as the engine has every indication of having excessive blow-by and excessive clearance at the rear main bearing.

I would recommend that you make an oil leak test on these engine bearings as a check for leakage. If you do not have an oil leak test tank, you can undoubtedly borrow one from the jobber from whom you purchased your bearings. If these bearings are leaking more than a few drops a minute, there is excessive clearance present and you will have to either install new bearings, or possibly regrind the crankshaft once more.

There is also a possibility that the oil is leaking from the crankshaft rear bearing, and your oil leak test will disclose this condition if you have removed the fly wheel.

If you have excessive fumes coming from the crankshaft ventilator, you undoubtedly have a bad case of blow-by, and I would like to point out that it is possible to have high compression at cranking speeds, but after the engine starts operating, the blow-by takes place. If your piston clearance is correct, it would indicate that you should use a different type of ring, because some rings are designed to control oil consumption by permitting a certain amount of blow-by.

### Cylinder Not Firing

We have a 1939 Hudson in our repair shop. No. 6 cylinder won't hit. We have ground the valves, put a new distributor cap on. It has plenty of spark to the plug. We checked compression and it has 100 lbs. What can we do to get No. 6 to fire?—Thomas DeSalvo, Elmwood, Ill.

**S**INCE compression in No. 6 cylinder is up to standard, and you are getting a good spark at the plug, it would seem that the only reason why this cylinder is not firing would be because of dilution of some of the mixture. This could result from a vacuum line attached to the manifolding at that point, or a very badly worn intake valve stem.

In addition, I would advise checking the valve spring tension on both valves to make sure that these are up to standard.

### Ford Oil Pan Removal

Can you give us the proper procedure to remove and reinstall the oil pan on the 1941-42 Ford 6? We would appreciate any information on this subject.—Ehleringer Garage, Iona, Minn.

**T**HE best method for removing the oil pan on the six-cylinder Ford is to remove the starter, and then jack-up the front of the engine as far as it will go, and place a block between the vibration damper, and the front crossmember. This will permit removal of the oil pan front bolts, and the remaining bolts are, of course, easy to get at.

Butch . . .

BUTCH / YOU CLEAN THE PLUGS IN DOC JONE'S CAR.

ROGER!

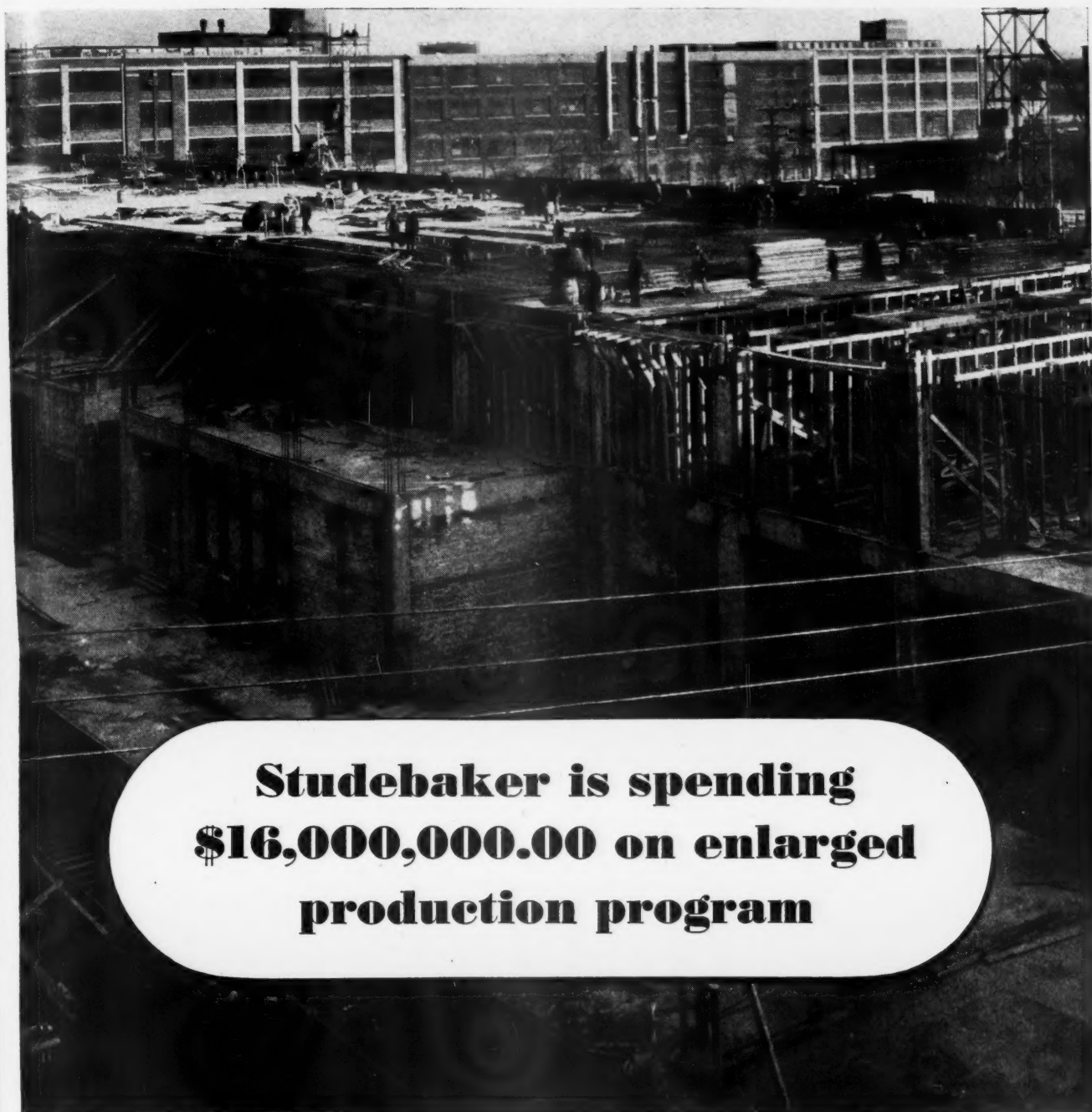
BOY! I'LL GIVE THEM A CLEANING LIKE THEY NEVER HAD BEFORE!

LOOK, BOSS! DID YOU EVER SEE ANY CLEANER PLUGS?

I DON'T SEE HOW YOU COULD HAVE GOTTEN THEM OUT AND BACK IN SUCH A SHORT TIME - LET ALONE CLEAN THEM!

GOSH! I DIDN'T KNOW YOU HAD TO TAKE THEM OUT - I CLEANED THEM RIGHT WHERE THEY WERE!





**Studebaker is spending  
\$16,000,000.00 on enlarged  
production program**

**New equipment and increased facilities to meet the  
expanding needs of Studebaker dealers**

**T**HAT new building you see nearing completion in the picture above shows you only one step in the great \$16,000,000.00 expanded production program that's under way at Studebaker.

Before long, not only new buildings, but also new factory equipment and machines, new conveyor systems, advanced foundry installa-

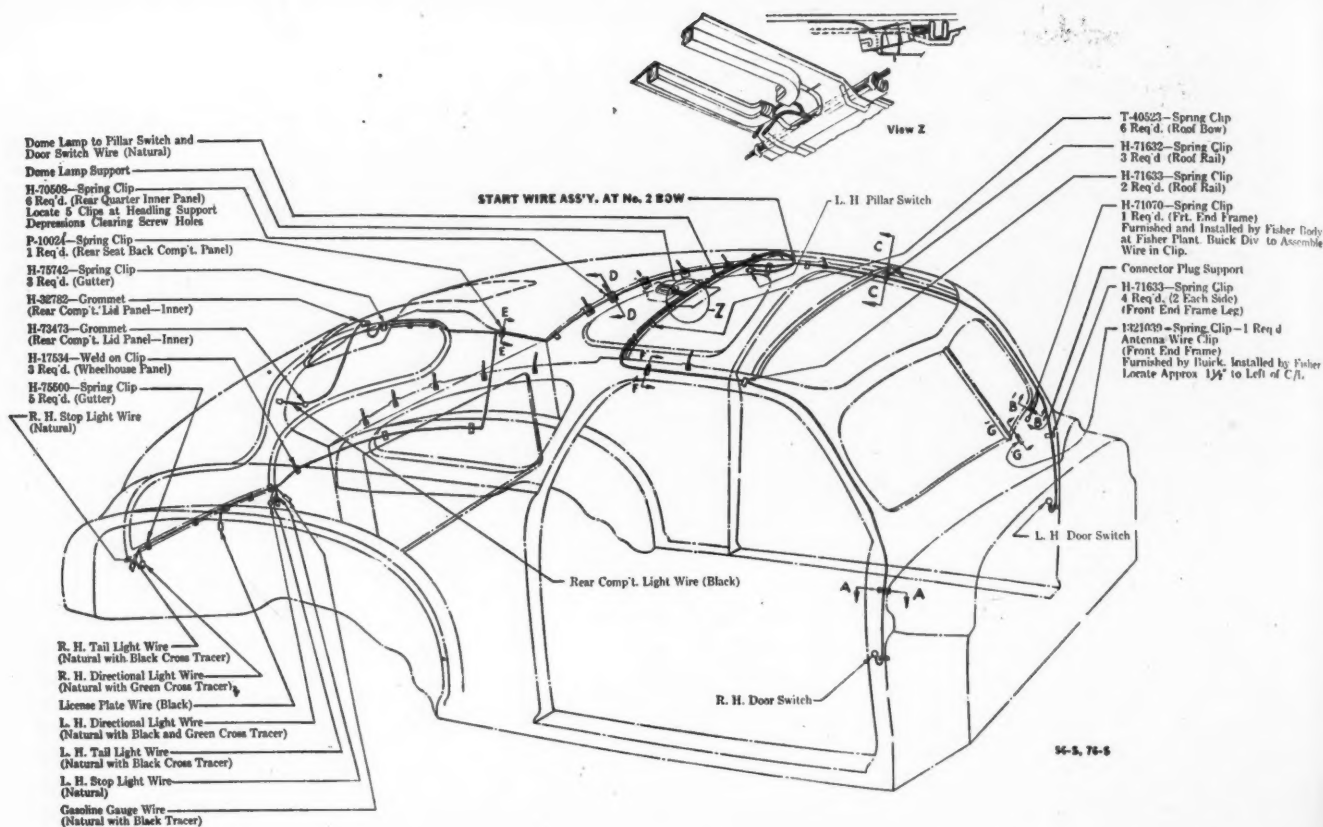
tions and extensive retooling and modernization of existing plants will enable Studebaker to surpass substantially its pre-war output of fine cars and trucks.

This expansion program is one reason why Studebaker dealers face the future so confidently. And commencing soon, the most intensive merchandising and advertising

campaign in Studebaker history will throw a strong and steady spotlight on Studebaker style, economy and superior value.

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South Bend 27, Indiana, U. S. A.  
**AMERICA'S FRIENDLIEST  
FACTORY**





**Body Wiring Diagram, 1942 Buick, Models 56-S, 76-S**

## Bearing Failures

We have completely overhauled one 1937 Plymouth motor, installing new piston rings, connecting-rod bearings, main bearings, and valves. We checked the crankshaft of this car and found it in good shape, being perfectly round and all oil passages open.

After this job was completed, the car was driven approximately 800 miles when No. 3 connecting rod bearing broke down. We disassembled the motor, replaced all of the connecting rod bearings and then, after the car was driven approximately 25 miles, No. 3 and No. 4 rod bearings pulled out. We then tore the motor completely down and checked it carefully, namely, the main bearings and the balance of the connecting rod bearings, the crankshaft and every possible phase of the motor that we can think of, without finding anything wrong.

We should like to know your opinion of all the possible reasons for these connecting-rod bearing failures. —A. Maryland Subscriber.

**BELIEVE** the trouble in this case is that someone has filed these connecting-rod bearing caps so that when you installed the new bearing inserts and tightened the caps, it caused a crushed fit of the bearing inserts. I

believe it will be necessary for you to install new connecting rods in order to overcome this trouble.

You might try installing shims on the bearing caps, if the owner will not stand the expense of new rods. In order to do this, it would be necessary to bolt the cap onto the rod with the insert bearings left out, and then, with an inside micrometer, measure the diameter of the bearing end of the rod in both directions. If the vertical diameter is less than the horizontal diameter, it will indicate just about how much metal was filed off the bearing cap.

Then, if you will get a shim of the thickness represented by the difference between the horizontal diameter and the vertical diameter and install the shims, one on each side of the bearing cap, it should restore the connecting rod to a true circle. It would then be possible to use this rod with new bearing inserts without the danger of crushing the inserts out of round when the cap is tightened to the rod.

There is another possibility in this case, and that is that the oil pressure is low after the engine warms up, due to the fact that too much oil is being thrown off by the camshaft bearings. There is a metering jet available that can be installed in the oil passage from the main bearings to the camshaft bearings which will meter the amount of oil sent under pressure to

the camshaft bearings, and this will help to restore the oil pressure to normal.

## Chrysler Motor Parts Moves to New Site

The Chrysler Motors Parts Corp. has started operation in new and larger quarters at 2985 Jefferson Ave., Detroit.

Known as the Mopar Building, the new site provides a total of 70,430 square feet of floor space for the supervision of a worldwide business in all types of replacement parts for passenger cars, trucks, and industrial and marine engines built by Chrysler.

The initial move involved the corporation's offices of operations and sales executives, general and regional sales, sales promotion and advertising, service, pricing and traffic. On acquirement of the remainder of the building the offices of inventory control and planning, technical records and accounting departments will be transferred to the new site.

For many years the general offices of the Chrysler Motor Parts Corporation have been located in the general office building of Chrysler Corp., in Highland Park. From this central point the work of seven parts plants, including Detroit and Marysville, Mich., was directed toward supplying dealers with necessary parts.

# TRUCUT

ARE you all set to meet the pressure of repair and service jobs that clamor for attention? Not unless you have one of these small but highly efficient labor saving, time saving TRUCUT Lathes on your bench.

The TRUCUT is indispensable in any repair or service shop that features precision workmanship and recognizes the profit possibilities in speedy and accurately powered tools.

The TRUCUT Armature Lathe and Undercutter machines and undercuts commutators, makes them like New, in 5 minutes.

...Does  
**MORE JOBS**

*faster -  
more accurately  
- profitably*



See your jobber or write

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*Armature Lathe & Undercutter*

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JANUARY, 1946

When writing to advertisers please mention Motor Age

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**FAST STARTING  
HORSEPOWER  
FOR ALL CARS**



**CASITE**

**GUARANTEES QUICK STARTING  
IN WINTER WEATHER  
OR DOUBLE-YOUR-MONEY-BACK**

● Every car owner wants quick, sure starting . . . no matter how cold the weather. And Casite guarantees it! Casite retards congealing of oil . . . lets motors spin over rapidly . . . saves batteries and tempers too. It's easy to use, profitable to sell . . . and it means sure-fire repeat business. Start cashing in on Casite now!

*A Pint in the Crankcase Every Oil Change*

**THE CASITE CORPORATION • HASTINGS, MICHIGAN**

**CASITE Gives Better and Smoother Performance All-Year-Round**

We guarantee that any motor capable of being started in a warm room will start promptly in the coldest weather when Casite is added to the crankcase according to instructions. If your car fails to start quickly, you get double-your-money-back by filling out guarantee certificate and mailing it to The Casite Corporation, Hastings, Michigan. Maximum refund is \$1.30 per pint, twice the nationally advertised price of Casite.



**LIST  
PRICE  
65¢  
A PINT**

## WASHINGTON RULINGS



## AND REGULATIONS

### OPA Establishes Ceiling Price on Used '46 Trucks

**C**EILING prices for used 1946 model commercial motor vehicles—trucks, truck-trailors and motorcycles—were established by the Office of Price Administration early this month at the same percentage levels in relation to new vehicle prices as those provided for 1945 models.

At the same time, the present schedule of percentages used in computing ceilings for used commercial motor vehicles was extended for use in 1946 pending further study by OPA as to whether there should be any reduction in these percentages to compensate for depreciation from age. The new action is retroactive to January 1, 1946.

Under the action, ceiling prices for used 1946 model commercial motor vehicles are established as 103 per

cent of the new vehicle list price when sold on a warranted basis, and 81 per cent of that price when sold "as is." The list price of a new vehicle is lower than the delivered price which includes taxes, transportation and handling and preparation charges.

### 254,800 Tires Are Released by Army

**M**ORE than 254,800 truck and passenger vehicle tires, both commercial and Army type, old and new, in a range of sizes including standard, have been declared surplus, the War Department announced.

They have been released, together with 79,100 tire tubes, to the Reconstruction Finance Corp., disposal agency designated by the Surplus Property Administration. The Army does not sell surplus property.

### Ceiling Prices for 1946 Mercury Models Announced

**C**EILING prices for Mercury 1946 model new passenger automobiles were announced late last month by OPA. They became effective December 14, 1945. The new 1946 model retail and manufacturers' prices are as follows:

#### CEILING PRICE

(Does not include excise taxes, transportation, or preparation and handling charges.)

	Retail	Manufac- turer's
Sedan (2 door)	\$1114	\$852.01
Town sedan (4 door)	1162	888.64
Sedan coupe	1151	880.38
Club convertible	1320	1009.41
Chassis with open or closed front end	835	638.74
Station wagon	1333	1019.59

Retail ceiling prices for some items of optional equipment, which may be added to retail car ceilings when optional equipment is supplied, are as follows: Bumper and guards, \$6.00; Fender shields (pair), \$14.50; Heater-Defroster, \$23.50; Oil filter, \$6.00; Radio, \$45.00; Wheel rings, \$7.75.

Retail ceiling prices for the new Mercury cars, exclusive of specification changes, on the average are approximately 4 per cent above those for the 1942 models in January, 1942.

Specification changes in the 1946 models over the 1942 models account for from \$30 to \$65 of the increase in prices, ranging progressively upward according to model. The retail prices reflect an absorption by dealers of 2½ per cent of their pre-war initial margins, OPA said. Absorption of 2½ per cent of pre-war margins is being uniformly required of all retail dealers of all makes of cars.

### Ceiling Prices on Surplus Chargers Are Revised

**D**OLLAR-AND-CENT ceiling prices established November 15, 1945, on new battery chargers and new storage batteries declared surplus by the armed forces have been revised, OPA announced recently.

The changes are effective January  
(Continued on page 90)



"She says she wants her brake shoes re-soled!"



*Better Care for Cars!  
Big Business for You!*



*the complete line of chemical maintenance products*

When you sell WHIZ chemical maintenance products, you sell those extra miles of carefree motoring that drivers demand. That's why it will pay you well to feature WHIZ, the oldest . . . the most complete . . . the most heavily advertised line in this big market.

*Ask your jobber salesman for details,  
or write for catalog and price list.*

**R. M. HOLLINGSHEAD CORPORATION**  
CAMDEN, NEW JERSEY; TORONTO, CANADA





## Low Priced Kaiser Has Front Drive

(Continued from page 21)

covering a public offering of 1,800,000 additional shares of common stock.

Marking the second step in the financing of the company, the proposed offering is designed to provide additional capital funds for the company's operations which, in addition to presently planned automobile production at Willow Run, may in future include assembly plant operations on the West Coast, expansion of manufacturing operations at Willow Run, the creation of a Canadian subsidiary

and other corporate purposes.

The present offering will raise to a total of 4,000,000 the number of outstanding common shares.

According to the registration statement, the corporation has proceeded with preliminary work at the Willow Run plant in preparation for the installation of its own machinery and equipment. However, the Reconstruction Finance Corporation has not completely cleared the plant of its machinery and equipment.

The company's present program, the statement continues, calls for installation of two assembly lines, each having an estimated capacity of approximately 375 cars on an eight-hour shift, and it is contemplated that each of these lines will be operated on two eight-hour shifts. The presently planned production of these two lines on a 16-hour working day would be approximately 1,500 cars a day. Of the planned production, it is estimated that 1,000 or more units will be Kaiser cars and the remainder Frazer cars.

The matter of prices of the new cars is in the preliminary discussion stage, the statement says, and the company expects to have further discussions with the Office of Price Administration leading toward fixing of the retail selling price of the Kaiser.

## MILES + PERFORMANCE *determines* QUALITY

The average motorist cannot distinguish real **QUALITY** in the various brands of automotive bearings. His only guide to real worth is the amount of service the bearings deliver. But you can help him. Sell Johnson Bronze Bearings. Then you know he cannot get higher quality anywhere. Our more than forty years exclusive bearing experience . . . plus the fact that we supply much of the original equipment . . . enables us to guarantee real **QUALITY**. When you sell Johnson, you sell performance. Write for new catalogue.

### JOHNSON BRONZE COMPANY

455 S. MILL STREET

NEW CASTLE, PA.



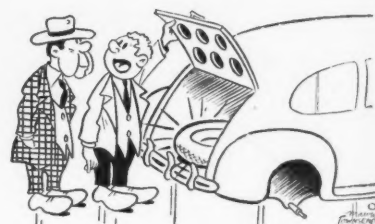
### NSPA Executives Meet For Planning Conference

Plans for organized effort on a broad industry front during 1946 will be perfected by officers, directors and committee members of the National Standard Parts Association in a three-day meeting in Gulfport, Mississippi, starting January 18.

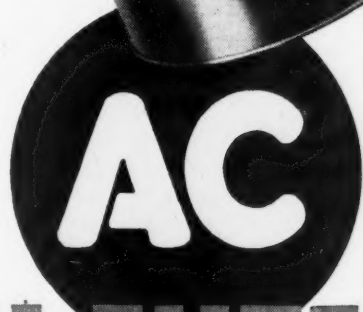
All regular standing committees and boards will conduct full-day sessions. On the opening day there will be meetings of the Membership, Marketing Research, International Trade and Executive committees. Product groups representing three major manufacturing groups within the association also will be in session on January 18. These are the committees for replacement parts, shop equipment, and accessories and supplies.

The second day of the conference will be devoted to sessions of the wholesalers' board of governors and the manufacturers' board of governors. On the final day these groups will combine for a meeting of the complete NSPA board of directors which serves as a clearing house for plans and recommendations developed by all other association groups.

NEW SUPER  
*Deluxe*



"Instead of four tires and no spare, this car has a spare and no tires!"



# OIL FILTERS

When you hang this official sign on your place of business, you immediately put the tremendous power of AC national advertising to work for *you*. Why? Because this sign will be featured in all AC advertising,—magazines, farm papers, newspapers, and radio,—from now on:

## 40 MILLION READERS!

AC's advertising on Oil Filters and Elements reaches 40 million people—every month. Your customers and prospects are among them.

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Just register as an AC Oil Filter Service Station with your AC wholesaler. And you not only get the Sign, but the world's greatest oil filter salesmen,—the AC Oil Test Pads,—and free window advertising, shop manual, sales literature, and installation manual.

Be a national advertiser "the AC way" and be in a profitable business that comes easily.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

★ ★ ★

HELP FIGHT INFLATION — BUY VICTORY BONDS

JANUARY, 1946

When writing to advertisers please mention Motor Age

57

**FOR MAXIMUM VOLUME -**

# Right

**1**

Stock and sell plugs customers readily accept—that have a reputation for dependability.

**2**

Stock a selection wide enough to service your own particular market, be it cars, trucks, tractors or stationary engines—or all of them.

**3**

For a minimum investment stock the types most generally used—yet insure your service reputation by having *all* types available as quick as a call to your jobber.

**4**

Offer a spark plug cleaning and testing service with modern equipment approved by the factory. This equipment should make cleaning and testing easier and more efficient as well as impress the customer with the importance of spark plugs.

**5**

The spark plugs you choose should be backed by powerful advertising if you're to realize the full profit potential in them. Timely promotion, factory engineering data and attractive point of purchase material should be available for your use.

**DEPENDABLE**

# Champion

**THESE ARE BUT A FEW REASONS WHY IT**



**TURNOVER - PROFITS - SELECT THE**

# Plugs

**CHAMPION SPARK PLUGS** are known and preferred by motorists the world over.

**CHAMPION SPARK PLUGS** are available in sizes and types for every gasoline engine, and your **CHAMPION** size chart tells you the right plug to use for each.

**CHAMPION** offers the dealer the "Utility Line" comprising only nine types. It meets the needs of practically all passenger cars. However, your jobber can supply you with any type promptly.

**CHAMPION** testers and cleaners, or combination units, show customers the exact condition of their plugs quickly, lessen sales resistance by their efficiency and do the work thoroughly. With this equipment you insure customer satisfaction and your service reputation.

**CHAMPION SPARK PLUGS** are backed by the largest volume of national magazine, farm paper and vocational advertising devoted exclusively to spark plugs. A constant flow of factory supervised promotional material and engineering data is supplied to dealers.



## Spark Plugs

**PAYS YOU WELL, TO STOCK AND SELL—CHAMPIONS**

JANUARY, 1946

*When writing to advertisers please mention Motor Age*

## 1946 Universal Jeep Lubrication

(Continued from page 22)

Fill to level plugs. Capacity  $\frac{3}{4}$  pt. per joint. Pressure Gun Grease every 6000 miles or 300 hours for field work.

### 15. Steering Gear Housing

Fill to level plug. Capacity  $\frac{1}{3}$  pt. Use SAE 90 EP. Check level every 6000 miles or 300 hrs. for field work.

### 16. Power Take-Off Housing

Fill to level plug. Capacity 1 pt. Below 32 degrees use SAE 80. Above 32 degrees use SAE 90. Check level every 6000 miles or 300 hrs. for field work.

### 17. Belt Pulley Housing

Fill to level plug. Capacity  $\frac{3}{4}$  pt.

Below 32 degrees use SAE 80. Above 32 degrees use SAE 90. Check level every 6000 miles or 300 hrs. for field work.

### 18. Differential—Front and Rear

Fill to level plug. Capacity  $2\frac{1}{2}$  pts. each. Use SAE 90 EP. Check level every 6000 miles or 300 hrs. for field work.

### 19. Ignition Distributor

Oil at cup, Breaker Arm, Pivot and Wick. Grease cam lightly. Below 32 degrees use SAE 10-W. Above 32 degrees use SAE 20 or 30. Lubricate every 1000 miles.

### 20. Generator

Oil at the oil cup at each end. Below 32 degrees use SAE 10-W. Above 32 degrees use SAE 20 or 30. Lubricate every 1000 miles.

### 21. Starting Motor

Oil at the oil cup at front end. Below 32 degrees use SAE 10-W. Above 32 degrees use SAE 20 or 30. Lubricate every 1000 miles.

### 22. Air Cleaner

Fill to level mark. Capacity  $1\frac{1}{4}$  pts. Below 32 degrees use SAE 10-W. Above 32 degrees use SAE 20 or 30. Change oil every 2000 miles under normal operating conditions. Under extremely dusty conditions, change oil twice daily.

### 23. Governor

Fill to level plug. Capacity  $\frac{1}{3}$  pt. Below 32 degrees use SAE 10-W. Above 32 degrees use SAE 20 or 30. Check every 2000 miles.

### 24. Wheel Bearings

Disassemble and repack. Use chassis lubricant. Perform this operation every 6000 miles or 300 hrs. for field work.

### 25. Power Take-Off Universal Joints

Disassemble and repack. Use chassis lubricant. If often used for continuous operation, perform this operation once each year.



*And Now, BY POPULAR DEMAND*  
**we give you PURITAN FLUSHING FLUID**

Ask any brake service man what he needs most to do a better job and he'll answer, "A really fast and effective brake flushing fluid."

And here it is—just in time for the Winter Service Program\*—Puritan Hydraulic Brake Flushing Fluid. A carefully engineered product developed by Puritan chemists—the same men who gave you the only all

"miscible" Brake Fluid. Puritan Flushing Fluid makes the formerly messy, slow and therefore often neglected brake system cleaning job a quick, simple and money-making operation.

Get your supply of this new profit-making Flushing Fluid from your NAPA jobber. Be quick to bring to your customers this long-wanted service.

\*Flushing Fluid is a timely service aid. Brake fluid oxidation and gum formation are aggravated by cold weather. Now is the time to flush brake systems!

**PURITAN COMPANY, INC.**  
**ROCHESTER, NEW YORK**



"We're selling this stock out cheap, mister. Now that the war is over, we're going back to handling auto supplies!"

Thousands of dealers are proving it

# A UNITED MOTORS FRANCHISE

## IS A SOUND BUSINESS PROPOSITION



Take a look at the *extra* advantages of a United Motors franchise, and you'll see why so many dealers and service stations find the benefits of this contract practical, profitable and continuous.

Take a look at the United Motors lines—each one an *original-equipment* line, nationally known and accepted, and used in America's most popular cars. When you get lines like these, backed by hard-hitting sales programs, up-to-the-minute service instructions and all the other United Motors "extras," then you have *everything* you need for a sound, money-making service business.

Take advantage of all that United Motors offers you. Call your United Motors distributor, or write us direct.

### A UNITED MOTORS FRANCHISE Gives You These Advantages

**UP-TO-THE-MINUTE SERVICE INFORMATION**—easy to use; speeds your work.

**ORIGINAL-EQUIPMENT PARTS**—leading lines of leading manufacturers.

**NATIONALLY KNOWN LINES**—respected and accepted everywhere.

**TIMELY SALES PROGRAMS**—individually planned.

**MERCHANDISING ADVICE**—based on long experience.

**"SINGLE-SOURCE" CONVENIENCE**—saves time, simplifies ordering.

**COMPLETE PARTS LINES**—parts for old cars and new.

**UNITED MOTORS SIGN**—business-boosting identification.

## UNITED MOTORS SERVICE

DIVISION OF GENERAL MOTORS CORPORATION • GENERAL MOTORS BUILDING, DETROIT 2, MICHIGAN

DELCO Batteries  
AC Fuel Pumps, Gauges  
and Speedometers  
INLITE Brake Lining  
DELCO Radio Parts

HYATT Roller Bearings  
DELCO Auto Radios  
HARRISON Heaters  
DELCO Home Radios

NEW DEPARTURE Ball  
Bearings  
HARRISON Thermostats  
DELCO Shock Absorbers  
GUIDE Lamps

DELCO-REMY Starting,  
Lighting and Ignition  
KLAXON Horns  
HARRISON Radiators  
DELCO Hydraulic Brakes



## Synchronizing Tractor, Trailer Brake Operation

(Continued from page 23)

trailer. These valves have large ports and air passages which speed up brake application on the trailer to reduce the lag between the brake application on the two vehicles to a minimum. A typical valve of this type is the B-K SCV valve.

When a larger capacity valve of this type is used, it is necessary that the hose lines leading from the reservoir tank to the trailer valve and

from the trailer valve to the trailer power chambers, be large enough to handle the volume of air without restriction. The advantages of the larger capacity, faster acting relay valve are lost if these hoses are not sufficiently large to handle the additional volume of air. The largest size valves generally require a hose with at least 1 inch inside diameter. It is also necessary that the inside di-

ameter of the fittings in the power chambers be large enough to handle the same volume of air as the hose, so as not to cause a restriction which would also defeat the purpose of the larger valve. On many trailer installations, it will be found that the power chambers are provided with a fitting which has too small a thread diameter to accommodate a larger fitting to take care of the increased hose size. In these cases, it will be necessary to install new power chambers to overcome this condition.

Another means of providing synchronization between the tractor and the trailer brakes, is the installation of a hand control valve. The hand control valve should not be installed indiscriminately as a means of compensating for faults or defects in the trailer braking system. A valve of this kind provides the flexibility of operation required for holding the tractor and trailer train in line on slippery surfaces, and particularly where there is a down grade. The foot pedal still functions, even when a hand control valve is installed on the vehicle, to apply the brakes on both the tractor and the trailer, and the need for synchronization of the brakes between both vehicles continues to exist.

### Danny De Paolo Becomes West Coast Distributor

Danny De Paolo scion of one of America's most famous speedway families has become Norwalk tire and battery distributor in Hollywood and Beverly Hills, Calif. A former automobile race driver, himself, Danny grew up in the atmosphere of burning castor oil and high-powered motors. His older brother, Peter De Paolo, is former twice national speedway champion and Indianapolis winner, while his uncle, Ralph De Palma was one of the pioneers of the "roaring road" who campaigned in the era of Barney Oldfield and was a reigning speed king for 25 years.

Danny De Paolo has long been in the automobile accessories merchandising field. In becoming a Norwalk distributor, he renews association with his old friend Jerry Hawkins, who is now Norwalk manager on the Pacific Coast and formerly was a sales executive for the Gilmore company.

A host of friends in the Southern California automobile industry, including fellow pilots of speedway days and Hollywood stage, screen, radio personalities were on hand for the grand opening of De Paolo's Hollywood headquarters. Midget race cars and a car from the Indianapolis speedway were on display and Peter De Paolo, recently a colonel in the Army, was present with friends of the movie colony.



**... ream satin-smooth finishes in pistons ...**

... steering knuckles, conrods, fan and pump bushings, as well as many other everyday automotive reaming jobs. Eliminates honing. Left-hand flutes of two blades, spiralling opposite right-hand flutes on the third blade at the same time, shear commercially perfect finishes to very close tolerances. Straight line expansion from .035" in the smaller sizes to .080" in the larger sizes, means Lempco reamers last much longer. Blades may be resharpened 8 to 10 times, economically replaced when worn out. Long pilots are available for line reaming jobs.

WRITE FOR CATALOG

**LEMPCO**

5722 DUNHAM RD.

• BEDFORD, OHIO



# PROFITABLE RESOLUTION!

**1946**

*Again I resolve: to  
build good will by giving  
my Plymouth, Dodge, DeSoto,  
and Chrysler customers*

*the best service  
by installing  
MöPär factory  
engineered and  
inspected Parts  
that fit accurately  
last longest, and  
perform best.*

ALWAYS USE  
MÖPÄR PARTS  
for

**Plymouth**

**DODGE**

**DeSoto**

**CHRYSLER**

**DODGE Job-  
Rated TRUCKS**

## NOTE TO REPAIR SHOPS

If you need parts of any kind for a Plymouth, Dodge, DeSoto,  
or Chrysler, obtain them from a dealer for these vehicles.

★ ★ ★

Hear America's Most Popular Conductor—Andre  
Kostelanetz and his "Music Millions Love," with famous  
guest stars—every Thursday, C.B.S., 9 P.M., E.T.

**CHRYSLER CORPORATION — PARTS DIVISION**  
**DETROIT 31, MICHIGAN**





## Crosley Features New Four Cylinder Engine

(Continued from page 24)

quently, has stamped steel cylinder heads and steel cylinder barrels, the latter being formed from SAE 3140 material. Subsequent heat treatment of the fabricated assembly develops suitable hardness values for the various elements subject to heat and wear.

Pistons are of heat treated permanent mold aluminum with an aluminum oxide surface finish, cam-ground, and weigh 4.92 oz. each. Piston pins

are of floating type with aluminum plugs at each end. There are three rings per piston—one oil ring and two compression rings. The drop forged con rods are tiny—4.125 in. center to center—and weigh 9.62 oz. each. A feature of the rod is the use of integrally forged through bolts which are machined directly in the forging and are not separable. Con rod bearings are of precision steel-backed

babbitt type.

The crankshaft marks an interesting development for an in-line passenger car engine. It is a casting of high strength cast iron, fully counter-weighted, having five main bearings with the rear main taking the thrust. Main bearings are of precision type, steel backed babbitt, fitted with a clearance of 0.0015 to 0.003 in.

Intake and exhaust valves have the head of 2112 chrome-nickel steel. Carburetor is a Model DY-9B downdraft Tillotson, SAE  $\frac{3}{8}$ -in. The front mounted fuel pump and the air cleaner are supplied by AC Auto-Lite electrical equipment is standard—Model IGW 4181 distributor, Model AB-13 battery of 80 amp. hr. capacity, Model A-7, 14 mm. spark plugs, Model AK starting motor, and Model GAS third brush generator with voltage regulator.

The clutch made by Rockford Drilling Machine, is of single disc type with two molded-asbestos linings of 6-in. O.D., 4-in. I.D.,  $\frac{1}{8}$  in. thick. A Warner Gear Model ASI-T92 three-speed transmission with manual control is standard.

The valve system, as illustrated, features a bevel gear drive instead of the conventional chain drive. The vertical shaft is drilled to carry oil under pressure to the five camshaft bearings. The oil pump and distributor are driven by helical spur gears from the crankshaft. The oil pump, fan, generator, and water pump are driven at  $\frac{1}{4}$  engine speed.

The engine has a full pressure system for lubrication, using a geared oil pump producing 50 lb. pressure. The crankcase and flywheel housing are aluminum castings, the oilpan is a steel stamping. The entire fabricated assembly is Bonderized before machining.

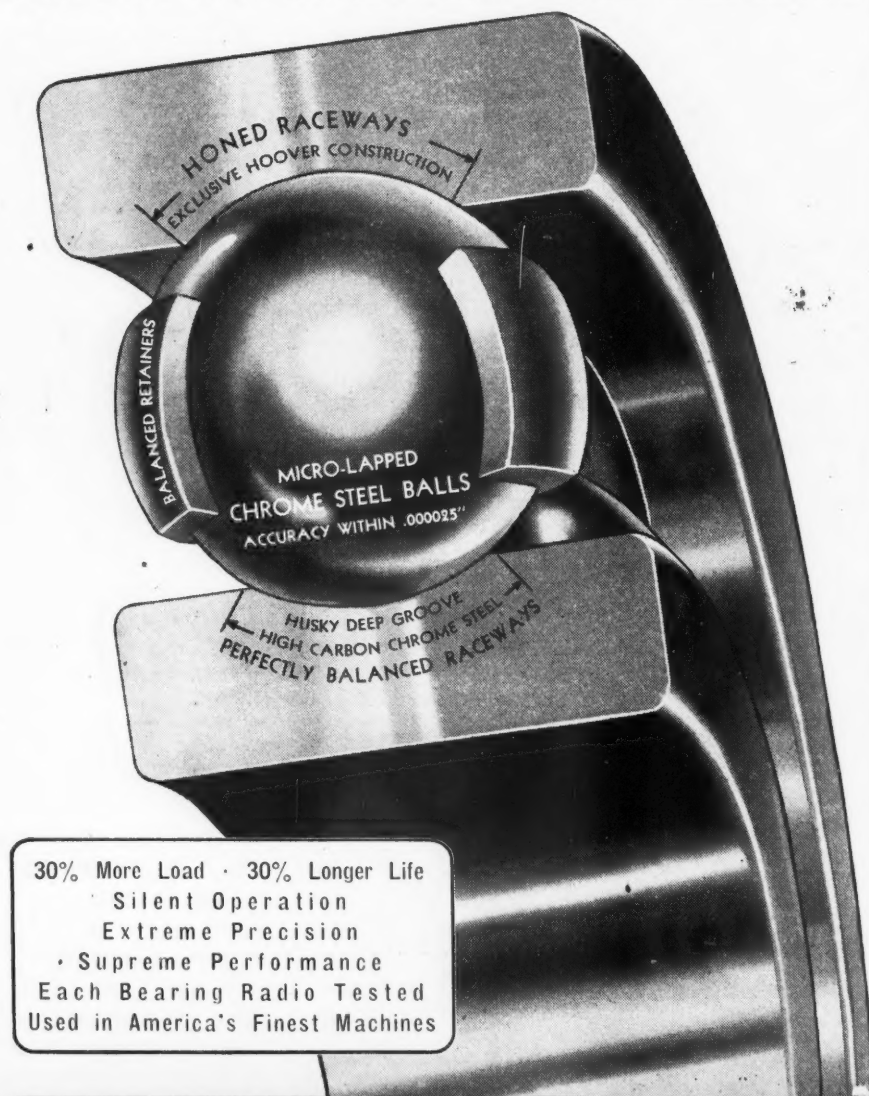
During the war, the Bureau of Ships, U. S. Navy, which conducted the Annapolis tests, contacted Crosley for the construction of six experimental engine generator sets for PT boat installation. In September, 1944, the Navy placed a second order for 2000 engine generator sets to furnish power for the gun turrets of amphibian landing tanks. One of the test sets was operated by Crosley day and night for 1200 hours, and after close inspection only the exhaust valves required attention due to the effects of 100 octane gasoline.

The five main bearing crankshaft is a high strength iron casting with induction hardened bearings. It is about one inch shorter than a conventional three bearing shaft which requires a larger center bearing and an increased shaft length. Dynamic balance is held within  $\frac{1}{4}$  inch ounce.

Outstanding feature of the engine is the construction of the cylinder block which is made up of light wall—

(Continued on page 68)

## *So much more...for so little more* AMERICA'S SUPER FINE BALL BEARING



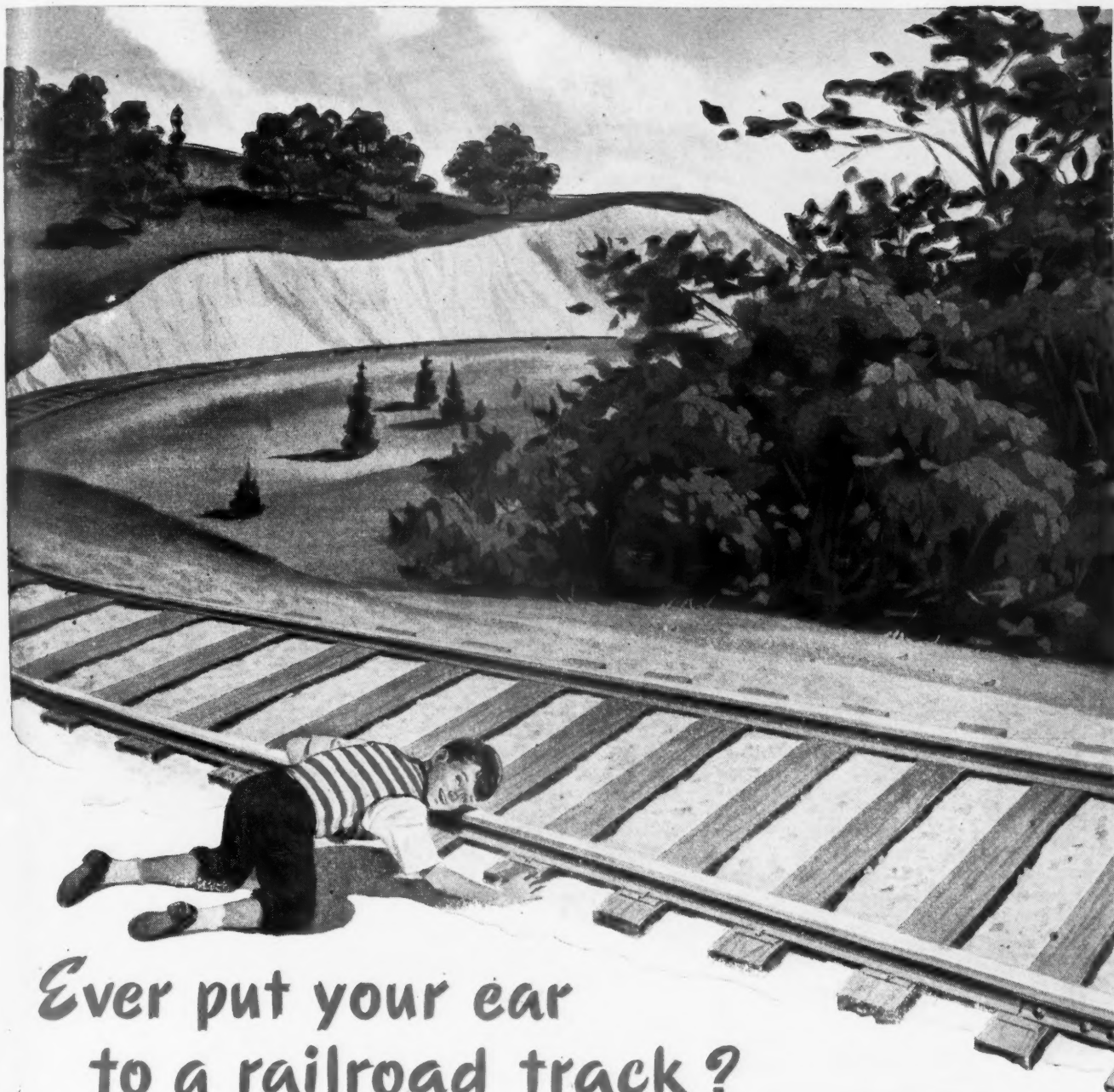
30% More Load • 30% Longer Life  
Silent Operation  
Extreme Precision  
• Supreme Performance  
Each Bearing Radio Tested  
Used in America's Finest Machines

# HOOVER

*The Aristocrat of Bearings*

HOOVER BALL AND BEARING COMPANY, ANN ARBOR, MICHIGAN





## Ever put your ear to a railroad track?

Remember when you used to do this as a kid to hear the rumble of something coming? Of course, we haven't announced it yet—but don't take too lightly that rumble you've been hearing about NUGGETS. We'll be blowing our whistle for your stop just as soon as these wrenches can again be rushed on the market. And you'll want to be first in line for these slim, trim babies that make old-fashioned wrenches look like gay-ninety gals. NUGGETS

will be made of famous Blackhawk Hexite steel, (the super steel that is 33-1/3% stronger than ordinary wrench steel.) Hexite permits the Blackhawk exclusive 7/16" Double-Duty Drive which does all the work that now requires both the 3/8" and 1/2" drive wrenches. No need for you to buy two sets of wrenches when one set of NUGGETS will do the job. Wait for NUGGETS! A product of Blackhawk Mfg. Company, Dept. W616, Milwaukee 1, Wisconsin.

# BLACKHAWK

**TO PRESENT NUGGET OWNERS:** If you have lost any of your *prewar* NUGGET Wrenches, see your Blackhawk Jobber. He will arrange delivery of the replacements. Blackhawk wishes to protect the investment of present owners, even though Nuggets cannot be made and sold on a mass scale to new buyers until Hexite steel is again available.

## NUGGET



Don't Buy Two Sets when ONE will do the Job!

## SOCKET WRENCHES

JANUARY, 1946

When writing to advertisers please mention Motor Age

65

# *What happens at when Mr. Kelly's*





# at the Factory lights burn out?

Here's what happens at Nash.

A dealer report on service of any kind automatically goes on record at Nash Service Headquarters. It can't get lost, or buried, or shoved into a dark drawer. It goes up on a blackboard.

Within one day this individual report is checked against a dozen service factors, and is incorporated into a complete nation-wide picture of the performance of each *part* of each series of Nash automobiles.

Here you see Nash engineers and service department executives studying those blackboards as eagerly as a broker watches his ticker tape.

This system quickly shows up whether Mr. Kelly's lights are a "freak" case, or due to service, or due to driving conditions peculiar to certain geographical regions. And if there's even the remotest possibility of a "bug" existing in any part, that can be *acted on fast*.

The important thing to you as a dealer is—*those changes are made in current production*. Not held over for next month, or "saved" for next year's models—but put right into the series rolling off the line.

This "triple play" system—from Dealer to Service Manager to Engineer—originated by Nash, has shown the whole industry a way to build better automobiles. And you see the results in today's Nash automobiles—the grandest cars we have ever built.

*A few selective dealer points are still available.*

## NASH MOTORS

*Division of Nash-Kelvinator Corporation, Detroit 32, Mich.*

# **YOU'LL BE AHEAD WITH** *Nash*

Tune in Nash-Kelvinator's hit musical program Wednesdays  
10:30 p. m. E.S.T. • 9:30 p. m. C.S.T. • 8:30 p. m. M.S.T.  
7:30 p. m. P.S.T. • Columbia Broadcasting System



## Crosley Features New Four Cylinder Engine

(Continued from page 64)

ed alloy steel tubing for the cylinders and cam follower guides, and of sheet steel stampings for the cylinder heads, intake and exhaust ports, valve cases, and water jackets. These stampings number about 120 pieces for the block. The parts are held in place by shrink fits, spot weld or crimping operations and form a firm structure even before brazing.

The assembly is then copper brazed

in a specially constructed furnace. The cylinder barrels harden to about 280 Brinell, and the valve seat inserts, which are made from a high carbon tungsten vanadium alloy, harden to about 450 Brinell. The warpage is held to about 1/64 in 16 inches by properly designing the stampings as to the height of extrusions, control of press fits, and rate of pre-heat and cooling in the brazing furnace.

The fabricated cylinder block weighs 14.8 pounds before machining, which consists of a light cut off the bottom cylinder plate and the top camshaft bearing and of boring and honing of the cylinder walls and cam follower guides. Only ½ pound of metal is removed during this machining.

The inside of the water jacket is covered with a clear, hard coat of plastic which, after baking, becomes so durable that it cannot be removed in a stripping tank of a strong caustic or acid solution. The material of the jacket is 20 gage, SAE 1010 sheet steel and the sides are ribbed in such a manner that nothing detrimental occurs to the block if the water in it is frozen solid.

The crankcase is only 3 inches high, weighs 7¾ pounds, and is a permanent mold aluminum alloy casting. The hold-down bolts for the cylinder block extend through the case to the main bearing caps. The crankshaft thrust is taken at the rear main bearing, which is the only flanged bearing. All connecting rod and shaft bearings are of the precision replaceable type.

The overhead camshaft is drilled the full length for the pressure lubrication of the five aluminum camshaft bearings. The cams actuate hardened and ground valve lifters, which are guided in alloy steel bushings in the cylinder block. The intake and exhaust valve heads are made from 21-12 chrome-nickel steel.

In addition to the stamped cylinder block, the crankshaft pulley, fan assembly and fan pulley, and the water pump impeller and pulley are made from copper hydrogen brazed stampings.

The cooling system holds 5 quarts of water and the lubricating system holds 3 quarts of oil, including the oil filter.

The engine is suspended in the frame of the car on three points. The rear engine mount is located between the frame crossmember and the transmission, and the two front engine mounts are bolted to the front right and front left of the crankcase, at such an angle that the rubber which is bonded to the brackets is in shear only. The thrust from the rear wheels is carried through the torque tube over the engine mounts into the frame.

High economy is attributed to the high compression pressure. The lack of detonation is due to the cool combustion chamber where preignition is prevented during the compression. The maximum wall thickness at any point separating the combustion chamber from the cooling water is .125". Because of the uniform substantially thin walls of the fabricated steel construction, including the portion between the valve seat inserts, and because of the generous contact between

(Continued on page 71)



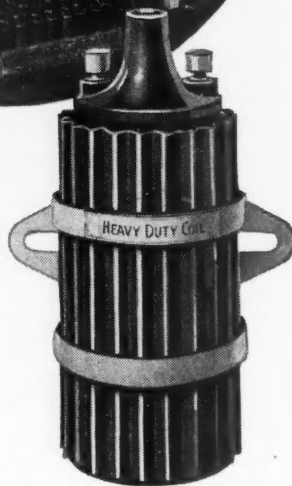
## GUESS-WORK IS OUT - - YOUR PROFIT ASSURED

Step-by-step production controls are a mighty important factor to every dealer, because they represent profit insurance. With Wells Ignition Parts in stock, you know that each and every part is a "blue print" for accuracy of specification — that proper fit and service are foregone conclusions. Parts so built are in ever-increasing demand because dealers realize that correct design and manufacture speed up the repair job and assure a satisfactory result.

Ask your jobber to show you a copy of "Inside Wells." Once you see what goes on inside the Wells factory, you'll understand why this complete line of ignition replacement parts is so popular.

**WELLS MFG. CORPORATION**  
Fond du Lac, Wisconsin

**WELLS IGNITION**  
*Quality Tells -- Demand WELLS*



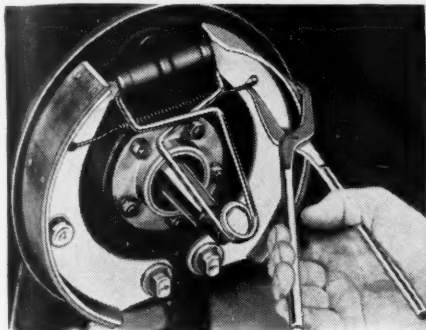
The super type windings used in WELLS Coils are electrically balanced, assuring extremely high voltage output for quick starting, high speed operation.

# Thermoid *precision processing*

**MAKES EVERY BRAKE JOB**

***Right The first time!***

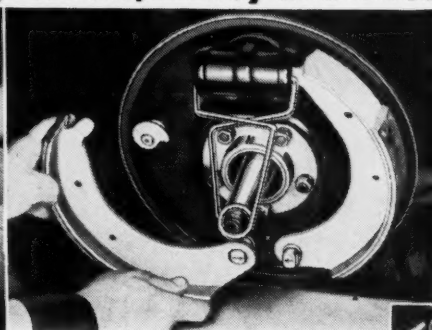
**Here is how Thermoid "Precision Processing" saves you time, money and labor**



**1.** To reline brakes the Thermoid way, the first step is to merely remove the old brake shoes.

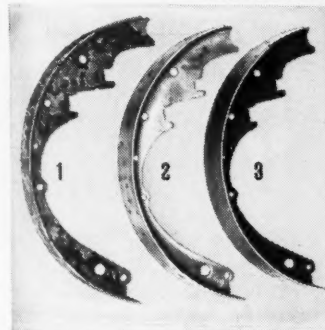


**2.** Your Thermoid distributor exchanges the old set of brake shoes for a set of Thermoid Precision Processed Brake Shoes, already lined.

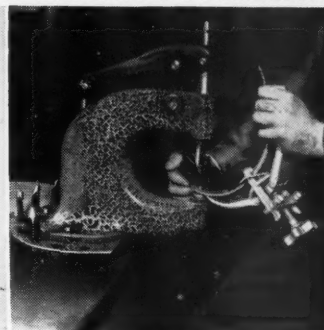


**3.** You install the Precision Processed shoes, make routine adjustments, and the job is finished. The brakes will be Right the First Time!

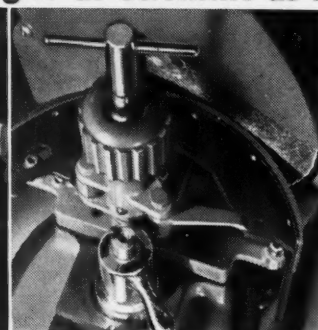
**Thermoid Precision Processing is as Scientific as it sounds**



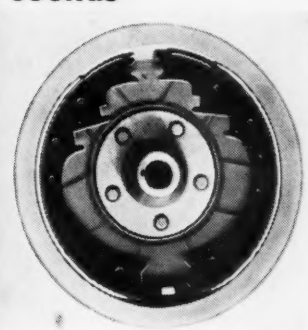
**1.** The old brake shoes are checked thoroughly for distortion and wear, the old lining is removed, the shoes cleaned and painted.



**2.** Thermoid Custom-Built Brake Lining, certified correct for the car, is then applied to the shoe by precision methods.



**3.** The relined shoes are then precision burnished to assure absolutely accurate fit when installed.



**4.** Here's the result. Immediate, 100% lining to drum contact that gives "new-car" brake performance on every reline job.

**NOTE TO PROGRESSIVE DEALERS:** Thermoid Precision Processing Franchise and equipment will shortly be available to those interested in doing the complete job in their own shops and building the very substantial brake lining business that Thermoid Precision Processing attracts.



Show your customers this Pittsburgh Testing Laboratory Certificate. It is an independent, authoritative guarantee that each set of Thermoid linings is correct for the car specified.

## Thermoid

CUSTOM-BUILT BRAKE LINING SETS

*plus*

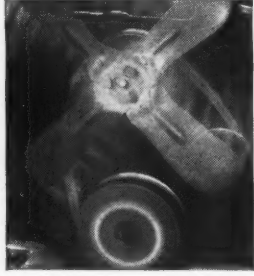
**PRECISION PROCESSING**

**THERMOID COMPANY, TRENTON, NEW JERSEY**

# The LIFE STORY of a FAN BELT



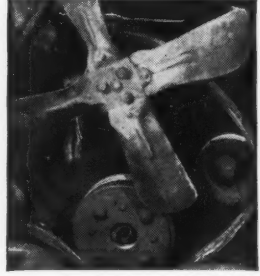
1. First IT STRETCHES



2. Then IT SLIPS

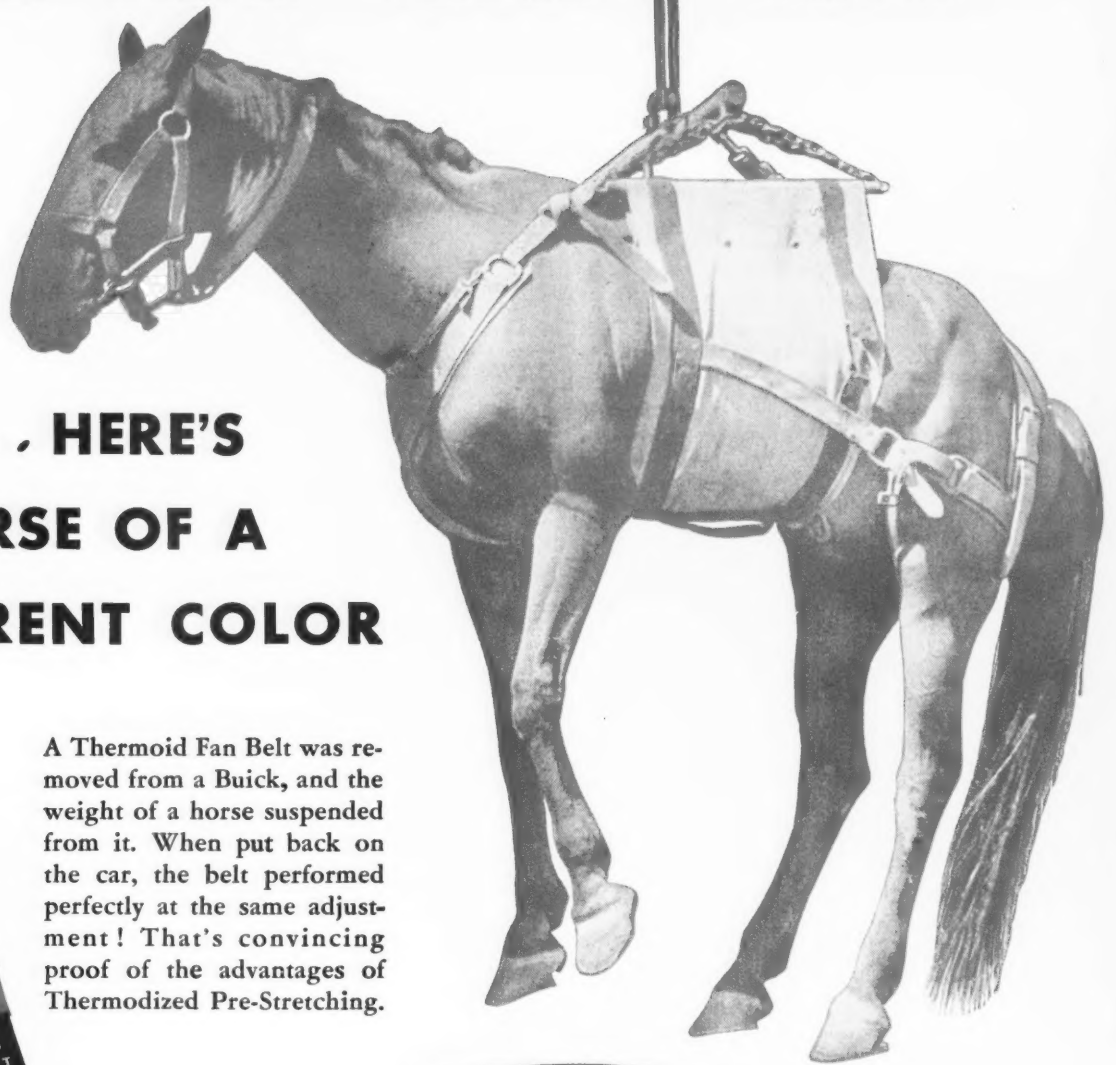


3. Then IT WEARS



4. Then IT FAILS

**But... HERE'S  
A HORSE OF A  
DIFFERENT COLOR**



A Thermoid Fan Belt was removed from a Buick, and the weight of a horse suspended from it. When put back on the car, the belt performed perfectly at the same adjustment! That's convincing proof of the advantages of Thermodized Pre-Stretching.

## Thermoid

**THERMODIZED *Pre-Stretched* FAN BELTS**

Join the thousands of dealers who have found increased sales and profits with Thermoid—and extra profits because of the Thermoid Sales Reward Premium Plan. Ask your jobber about the Thermoid Fan Belt Program, or write to us. THERMOID CO., TRENTON, NEW JERSEY.





"One can opener please!"

## Crosley Engine

(Continued from page 68)

these walls and the cooling medium, a much more even heat distribution is obtained. This prevents the accumulation of heat in certain areas, avoids hot spots, eliminates pre-ignition and permits compression ratios of 9 to 1 to be successfully achieved.

No information is available at this writing concerning service and maintenance operations, but it is assumed that some of the operations, such as grinding of valves, will require special handling.

The company also is studying the many possible uses of this engine for other applications. Among those being considered are: for marine and industrial use; for farm implements, generator sets, for auxiliary air conditioning equipment. Attention also is being given to the use of the engine for small farm tractors.

The engine was developed in Cincinnati by Crosley under the direction of Paul Klotzsch, their chief engineer, in cooperation with Lloyd Taylor.

Crosley has the exclusive license under all patents and to all developments of Taylor Engineering Co. Inc.

## Kaiser-Frazer to Make Own Auto Bodies

Joseph W. Frazer, president of Kaiser-Frazer Corp., announced that his company will manufacture its own bodies for the new Kaiser and Frazer automobiles.

Frazer, who is president and chairman of Graham-Paige Motors which is also operating at Willow Run, said the first of a series of huge 900-ton presses are now being made for the Kaiser-Frazer Corp. for installation within the next 60 days.

Volume production of the Frazer is expected to begin about March with the Kaiser following approximately six weeks later.

## Laboratory Improvements Promise Changes


Postwar laboratory improvements of wartime inventions promise, within another year, automobiles and other mechanical products of greater power, smoother performance and less expensive operation, predicts Harold Youngren, director of Borg-Warner's new engineering development section.

Both industry and the public, said Youngren, will profit by the plan-while-producing program established early in 1944 by C. S. Davis, the

corporation's president. New engineering processes and devices held back by the war now are going through the refinement stage, he revealed.

Youngren, who heads a group of engineers studying new developments, announced that a laboratory soon would be established in the Borg building in Chicago with additional facilities for experimental work. A research laboratory in Detroit, under supervision of Rodney Hoffman, is operated as part of the new section's activities.

Put More  
**ACTION**  
into  
Ignition



with  
**NIEHOFF**

APPROVED QUALITY PRODUCTS

There is a lift awaiting ignition-hungry motors in NIEHOFF Approved Quality Products.

They pack extra punch and power that assures quicker starting, smoother acceleration and sustained performance. They embody a high quality of materials and workmanship that enables you to do quality work that attracts quality customers.

Each NIEHOFF Part is attractively packaged and plainly marked for quick, easy identification. One complete simplified catalog with a single code system for all makes of cars speeds up ordering and service.

Ask your Jobber for NIEHOFF Products Today and put more action into Ignition.

C. E. NIEHOFF & CO • 4925 LAWRENCE AVE. CHICAGO 30, ILL.

BRANCHES: 1342 S. Flower St., Los Angeles 15, Calif.; 250 W. 34th St., New York 19, N. Y.

## Servicing the 1946 Ford Truck Distributor

(Continued from page 26)

the tang on the wide side of the distributor shaft as shown in the illustration. Turn the distributor shaft until the edge of the scale is  $\frac{3}{4}$  of an inch from the near side of the small mounting hole. One mounting hole is smaller than the other to correctly position the distributor on the engine. This small hole is nearest to the vacuum brake. All checking of the timing must be done from this small hole.

With the distributor shaft in this position, the left hand set of breaker points should be just starting to open.

The timing is controlled by the point at which the left hand set of points open. With the distributor shaft in this position, if the left hand set of points do not just start opening, it will be necessary to change the adjustment on the right hand side of the distributor to obtain the correct

timing. Move the adjustment up to advance the timing or down to retard the timing. After moving this adjustment, it will be necessary to recheck the timing.

If the proper timing is not obtained on the first attempt, the distributor shaft should be turned back at least  $\frac{1}{4}$  turn, to eliminate all backlash and the operation repeated. Any differences in octane number of the gasoline being used, can be compensated for by the vacuum brake adjustment. To adjust the vacuum brake, back off the adjustment until the engine "pings" on a road test under load. Turn the adjustment in just enough to eliminate the "ping" and tighten the adjusting screw lock nut.

*Central Mike Says:  
"Every Mechanic Needs  
These Two Sets!"*



**SET NO. 808**  
Inside Micrometers  
Range  $1\frac{1}{4}$  to 8 inches.  
**\$12.00**  
Complete with Extension  
Handle and Deluxe Plush-  
Lined Case

**SET NO. 745 RL**  
Outside Micrometers  
Range 0 to 4 inches.  
**\$46.50**  
Complete with Ratchet Stops,  
Lock Nuts, Standard Test  
Gauges and Deluxe Hinge  
Plush-Lined Case

THE CENTRAL *Certified Accuracy* MICROMETER  
**GUARANTEE**  
This guarantee of accuracy is based on care of handling, storage,  
cleaning or other cause and returned to the tool itself.  
The Central Tool Co.  
AUBURN, RHODE ISLAND

**CENTRAL**  
*Certified Accuracy*  
**MICROMETERS**

**WRITE TODAY FOR CATALOG No. 17**  
The entire line of individual micrometers and complete sets illustrated and fully described.

**THE CENTRAL TOOL CO. AUBURN, RHODE ISLAND**

**CENTRAL**  
FOR MORE THAN A  
QUARTER CENTURY  
SPECIALISTS  
IN FINE  
MICROMETERS



"Rice? Egad, I'm married!"

## L. C. Goad to Head Dayton G.M. Divisions

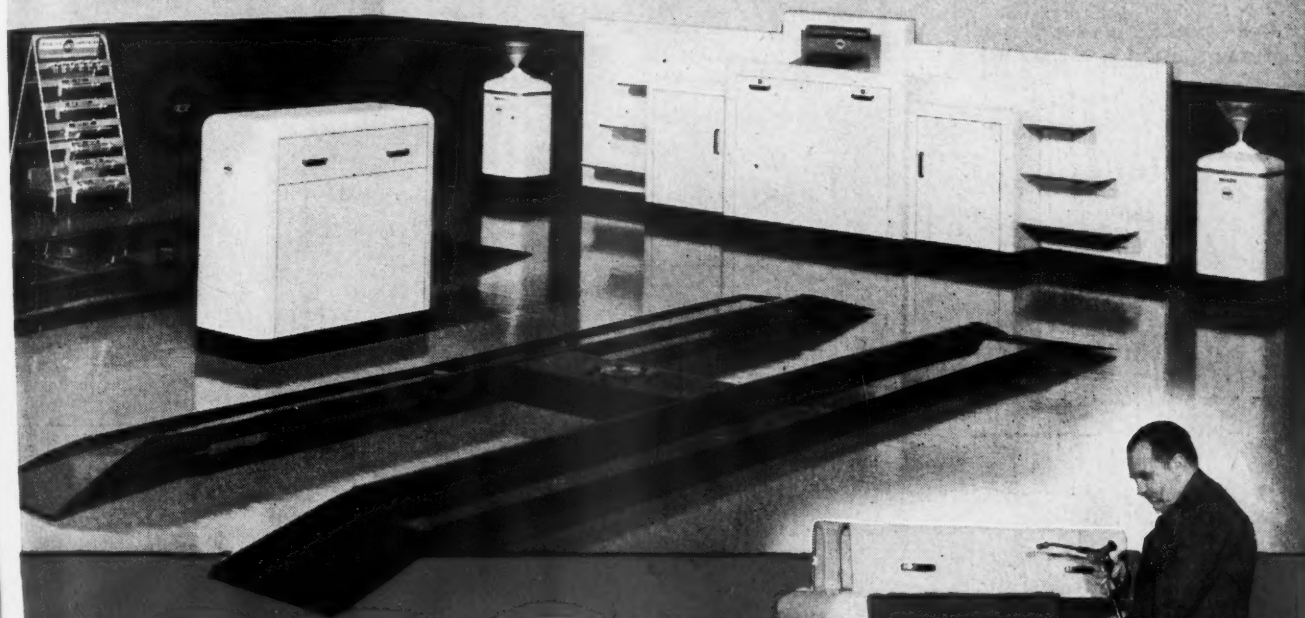
The appointment of L. C. Goad, vice president, as a group executive in charge of the General Motors divisions at Dayton, Ohio—Frigidaire, Delco Products, Moraine Products, Aeroproducts, and Inland Manufacturing; the Delco Appliance division at Rochester, N. Y., and also the Buick-Oldsmobile-Pontiac Assembly division with plants at Linden, N. J., and Southgate, Calif., and contemplated plants at Atlanta, Ga., Framingham, Mass., Kansas City, Mo., and Wilmington, Del., was announced by C. E. Wilson, president of General Motors.

Wilson also announced that W. S. Roberts, formerly assistant general manager of the Buick-Oldsmobile-Pontiac Assembly division, will succeed Mr. Goad as general manager of that division.

The Dayton divisions have been under the direction of E. F. Johnson. The BOP division has been under the jurisdiction of B. D. Kunkle, vice president, and the Delco Appliance division was in the group headed by F. L. Burke, vice president.



# NEW *Profit Center* LUBRICATION

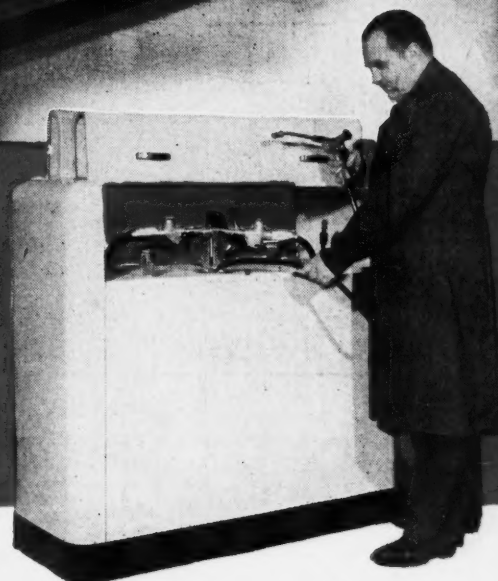


## ARO CENTER ISLAND LUBRICATION UNITS

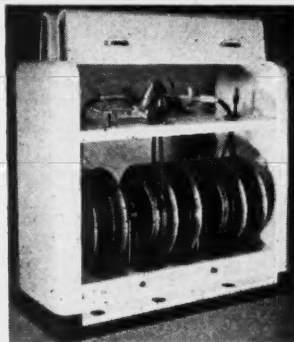
Now — ARO helps you make your lube department *more profitable than ever*... with the new ARO Center Island Lubrication Units!

These new compact units mean *neater, smarter, more efficient* service! The unit shown here has 6 automatic reels "right at your elbow" to serve two lube racks—yet all hose and reels are concealed when not in use. This includes two reels for chassis lubrication, two for gear, one for water, and one for air. Automatic stops—automatic rewind.

Other time-saving and step-saving units include—Center Island Unit with 3 lubricant pumps for original container service and 8 possible combinations of automatic hose reels—also individual reels for ceiling installation, for use with remotely installed pumping units. See your ARO Jobber for details. The ARO Equipment Corp., Bryan, Ohio.



ARO Center Island Unit "Open for business"—with hose for chassis lube, gear lube, water and air—all on automatic reels—bandy to speed up service.



Unit with lower panel removed—shows compact mounting of reels—ARO-built quality and dependability.



## Control Tower

(Continued from page 27)

more than twenty years, as manager of the service department, and George M. (Jake) Jaquith, who also has had twenty years experience in this territory as sales manager.

Modern machines for front-end alignment, wheel balancing, motor and brake work have been installed, as well as a new, well equipped body shop and painting department. A complete stock of parts is on hand. The shop employs 28 men and women, with a group of mechanics trained in

factory-approved service methods.

The firm is taking on a nationally advertised out-board motor (Johnson) for post-war extra business, and expects to have a separate unit for out-board motor business, consisting of a repair shop and a sales room with salesmen and repair men devoting full time to this line.

The Blaul Motor Co. already is planning expansion of its present set-up, as it is now working to full capacity in the shop. The number of mechanics will be increased as rapidly as efficient well-trained man can be found.

## C. A. Musselman

C. A. Musselman, chairman of the board of the Chilton Company, died January 3, in the Presbyterian Hospital, Philadelphia, after a long illness. He was 73.



He was one of the founders of the Chilton Company, and as secretary and treasurer in 1901, was responsible for many of the policies which were the basis of the success of the company. He became president of the automotive unit in 1923, and was elected president of the company in 1934, retiring from that post in June, 1945, to become chairman of the board.

Active for many years in both the automotive and publishing fields, he was a member of the Society of Automotive Engineers and had served as president of Associated Business Papers, and as a member of the board of the National Publishers Association. He was also a member of the Union League, the Philadelphia Country Club, and the Poor Richard Club.

Surviving are his widow, the former Mabel Moon; a daughter, Mrs. Mary Acton, and a grandson, David Acton,

## Weatherhead Announces Canadian Parts Policy

Standard parts for the Canadian automotive, industrial, aircraft and refrigeration industries will be made and shipped to the Canadian trade by its subsidiary company, The Weatherhead Co. of Canada, Ltd., at St. Thomas, Ontario, it has been announced by the Weatherhead Co. of Cleveland, O.

"This is in line with our policy to make the Canadian Company entirely self supporting and supply additional employment for Canadian workmen," said A. J. Weatherhead, Jr., president.



**it's not the cabinet...  
but the WORKS that COUNT!**



• With ignition products, too, it's not how they look, but what's inside that determines their performance.

When you use P&D starting, lighting and ignition replacement parts in electrical and tune-up jobs, you use parts made to satisfy customers, to bring you repeat business.

Handling P&D's ONE complete quality line minimizes inventory problems. And at the same time keeps satisfied customers on your books.



**SEE FOR YOURSELF**

Cut open a patented P&D Air Cooled Coil and then compare it with other makes, thus proving to yourself—*"it's not the outside container but the inside works that count."*

- 1 One piece ribbed aluminum air-cooled can. The ribbed fins assure sufficient surface to dissipate heat generated in coil windings, assuring uniform performance during operation.
- 2 "Perma-Sealing" method of sealing bakelite top to can making an absolutely moisture proof seal.
- 3 Patented high tension insert, eliminates soldered wire joint thus assuring against breakage by vibration.
4. High tension terminal, solid brass insert molded into cap, assures moisture proof connection.
5. Secondary and primary wound with proper size wire and balanced to give peak efficiency.

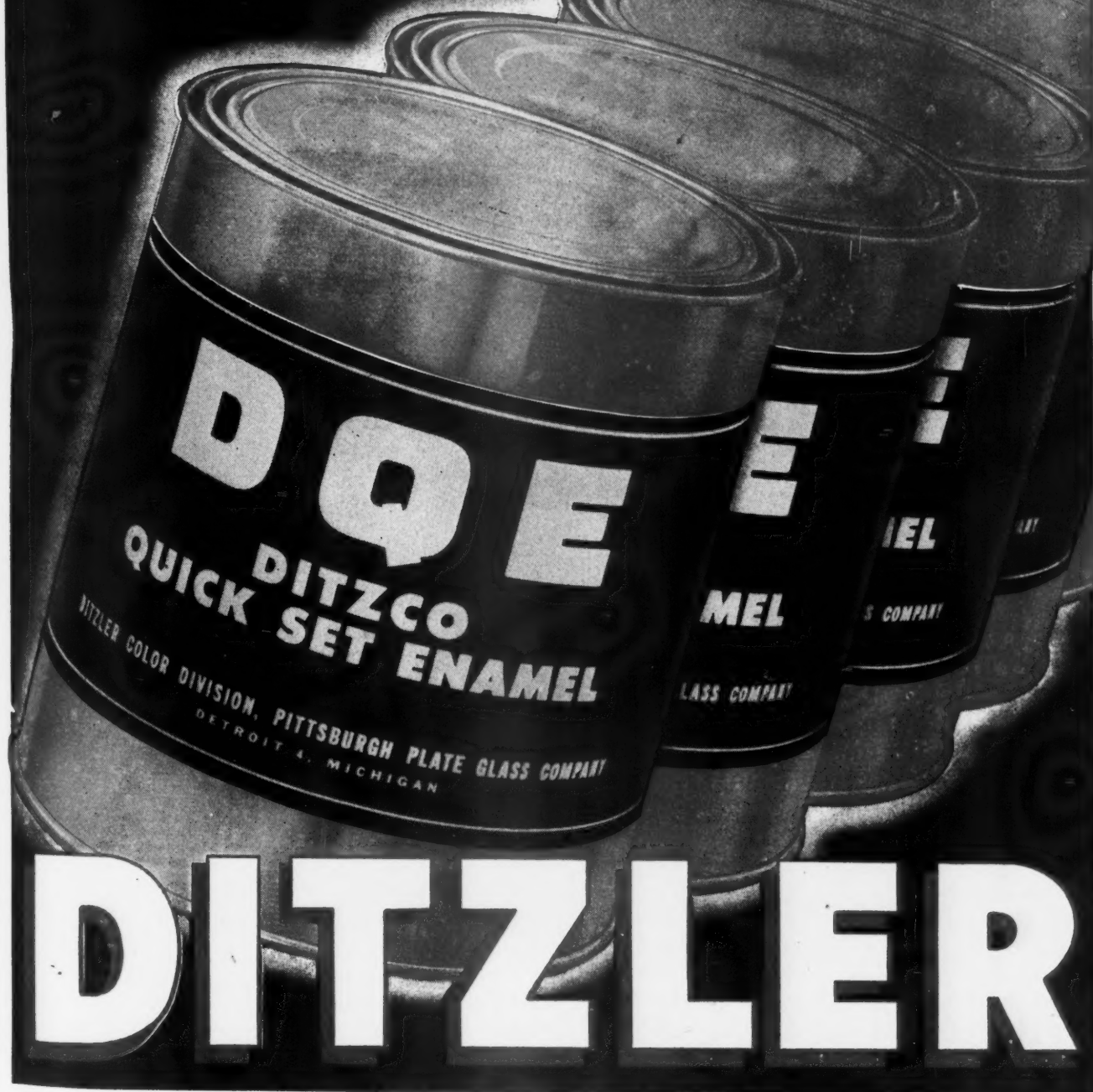
U S Pat No 102001



**MANUFACTURING COMPANY, INC.**  
LONG ISLAND CITY, NEW YORK  
STARTING • LIGHTING • IGNITION • REPLACEMENT PARTS

*Here it is...*

Ditzler's famous QDE (now DQE) enamel is again available—pre-war quality and better—Famous for easy workability, quick setting, high lustre, excellent adhesion, and outstanding durability. Ditzler Color Division, Pittsburgh Plate Glass Company, 8000 W. Chicago Ave., Detroit 4, Michigan.



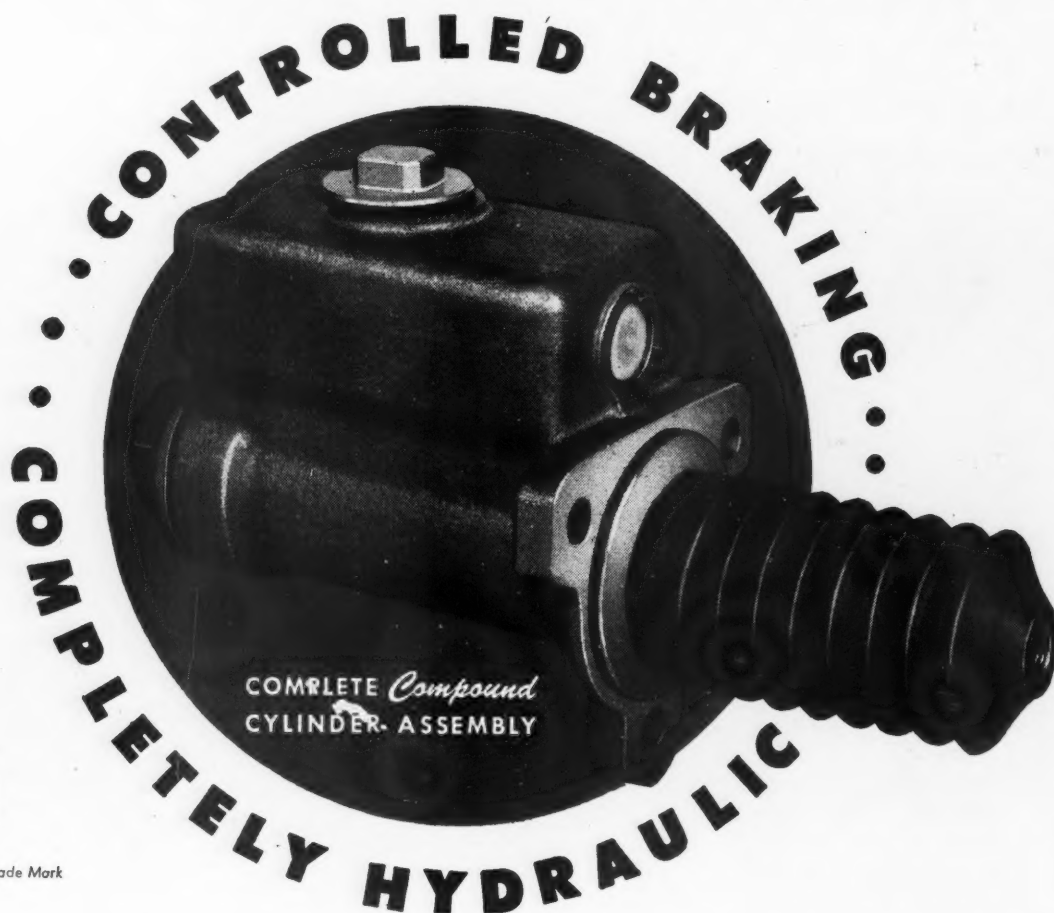
JANUARY, 1946

*When writing to advertisers please mention Motor Age*

75



# HYCON *Compound* Cylinder FOR TRUCKS & BUSES



Look for this Registered Trade Mark

Something *new* in power brakes! . . . because of their radically advanced actuating principles, HYCON *Compound* Cylinders deliver perfect brake control, correctly measured power, ease of installation, minimum maintenance, and all-around efficiency and economy in truck operations.

Drivers like HYCON because it has a "soft pedal" . . . operates independently of the motor . . . and **ELIMINATES** the **ATMOSPHERIC lag** of conventional type "booster" brakes.

Dealers and service stations like HYCON because it is a compact, self-contained unit, simpler in design, faster to install, and cheaper to service. Fleet owners welcome its surprising economy.

Automotive engineers approve its operating principles—the elimination of supplementary sources of power (vacuum or air) . . . the positive efficiency of all-hydraulic actuation . . . well-engineered functional design . . . the ingenious use of *two* pistons in one housing, to make extra attachments unnecessary.

## Road Tests Show . . .

Substantial savings in gasoline consumption. The compound cylinder permits adjustment of the carburetor to maximum idling efficiency, since the operation of the brakes does not disturb the carburetor mixture.

Substantial increase in tire mileage due to elimination of over-braking.

Fewer brake adjustments; no maintenance beyond that required by original equipment master cylinders.

Low original cost . . . ample controlled power.

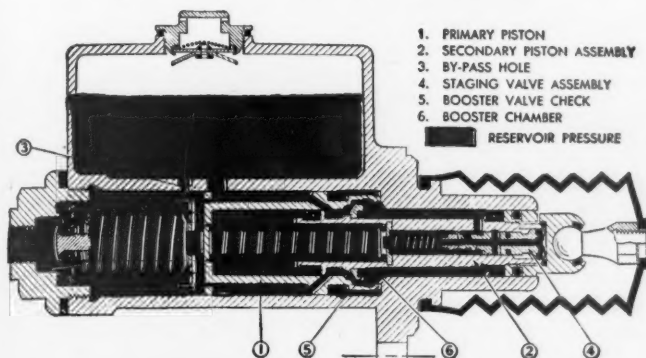
55 years of specialized experience in brake application and design for railroads has given this company an unexcelled technical experience in solving the most difficult braking problems.



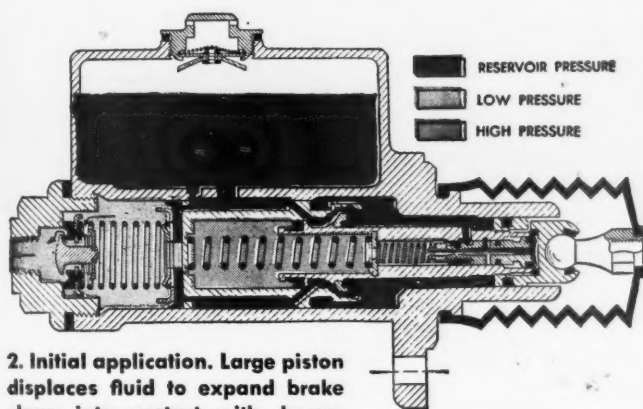
# Eliminates VACUUM-ACTUATED "BOOSTER"

## ... 3 Steps in HYCON Operation ...

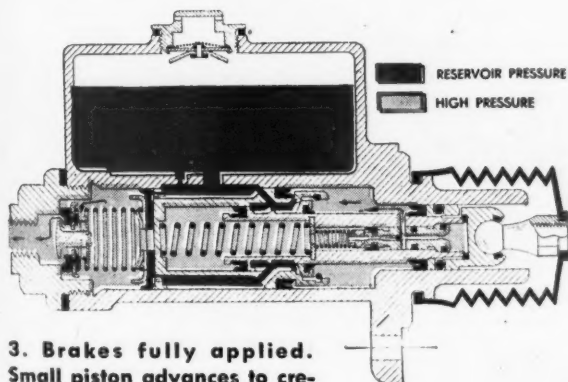
## No "Booster" Brake Needed



1. Brakes in the "released" position.



2. Initial application. Large piston displaces fluid to expand brake shoes into contact with drums.



3. Brakes fully applied. Small piston advances to create high hydraulic pressures.

The secret of *controlled braking* in HYCON Brakes lies in a *second piston* in the *compound cylinder*, which develops higher hydraulic pressures without the help of vacuum-air-actuated "boosters." The single HYCON unit performs hydraulically the combined functions of both master cylinder and power brake . . . gives more constant, more positive, more reliable braking control.

With HYCON, hydraulic pressures are in *direct proportion* to pedal pressures. The correct power is always available to meet load or no-load conditions. By eliminating the *lag* of the atmospheric pick-up on vacuum brakes, it will stop vehicles more quickly.

## Saving Split-Seconds on Stops

The higher safety factor in HYCON braking results from quicker stopping; better control. The unit occupies no more space on the chassis than the original equipment master cylinder; requires no additional tubing, and can be installed within an hour.

## Send for Demonstrator Unit!

HYCON compound cylinders are now available to replace 1¼" and 1½" Di. original equipment master cylinders. Order a demonstrator unit from your local power brake distributor, or write direct to The New York Air Brake Company, 420 Lexington Avenue, New York 17, New York.

**THE NEW YORK AIR BRAKE COMPANY**

420 Lexington Avenue, New York 17, New York

## Stray Tips on Spray Painting

(Continued from page 29)

end and lumpy at the other, like a tadpole. You know it's on account of the air pressure not bein' high enough. Then sometimes you might get a pattern that looks like a dumbbell. That means the pressure's too high.

"And suppose your gun starts makin' one that's thin at one end and thick at the other. That tells you the fluid nozzle is clogged. Or maybe the pattern looks like a half moon. The trouble in that case is a clogged air passage."

"Gee," Tommy cut in, "is there anything else that can go wrong?"

"Plenty. I've only told you about the things that can happen to the gun, or the way you hold it. There's a dozen other mistakes you can make if you ain't careful. Most of them is caused by not preparin' the surface right before you start to paint.

"Take blisterin' or peelin'. You can get it by usin' the wrong undercoat but, most of the time, it's due to not cleanin' the surface properly. You

not only have to sand the surface thoroughly, but also clean it with a cleanin' preparation. And you've got to be sure you get off any rust. If you don't, it'll come off after you finish the paint job and take the paint with it.

"And whatever you do, don't touch the surface after you've cleaned it. If you do, you'll leave fingerprints and they'll show right through the new coat of paint.

"One of the mistakes a lot of beginners makes is to forget about dust. They prepare the surface all right but then, between the time they clean it and the time they start paintin', all the dust in the shop settles on it. They paint over it and then wonder why they get a rough finish.

"And sometimes they don't remove all the wax, and the new paint starts liftin' right off. You always want to be sure you get rid of every last trace of wax. The best way to do it is to use a special wax remover. If the new paint don't lift, it might show up as wet spots in the new finish and the customer would never forgive you.

"There's just one other kind of trouble you run into when the surface ain't prepared right," Pop went on. "That's shrunk or split putty. Putty's pretty fast dryin' and has a tendency to crack. The only way to prevent it is to put it on in thin coats."

"One time when I was a kid," said Tommy, "we had our car repainted and it got a lot of tiny cracks in the finish."

"That's called checkin'," said Pop. "Most of the time it's due to applyin' the finish coat before the undercoat is thoroughly dry. But sometimes you get the same effect when you spray the coats on too thick. You always want to spray on just enough to cover and no more. If you don't get check-in' when the coat is too heavy, you're likely to get runs or sags. Of course you can get sags if you use too much thinner."

Pop set the spray gun on the fender and plunged his hands into his cover-all pockets. "There's a couple more things you gotta watch," he said. "One is overspray. If you painted the left side of a top or a cowl and then the right side, you'd get too much paint on the left side along the center line. The way to lick that, if it happens, is with a wet mist coat. You make it by mixing a lot of thinner with the color left in the cup. Then you spray it over the part where it's oversprayed. Sometimes you get better results if you use straight thinner without any color.

"Then there's the poor match you get if you compound too soon. It's best to let the finish dry about four hours before compoundin'.

"And finally there's the shrinkin' or splittin' you run into once in a while with the primer surfacer. That can

(Continued on page 80)

## A SWELL JOB EVERY TIME

BILL'S WIFE HUNG THAT SHINER ON HIM. HE TOLD HER HE WAS ONLY SHOWING OUR NEW GIRL-MECHANIC WHAT A SWELL RECONDITIONING JOB SHE COULD DO ON CARBURETORS AND FUEL PUMPS, WITH HYGRADE CONTAIN-ALL KITS.

BILL'S WIFE DID A SWELL JOB HERSELF!



**Hygrade Line**  
AUTOMOTIVE  
PRODUCTS

### HYGRADE REPLACEMENT PARTS

"Engineered for Old Units"



CARBURETOR AND FUEL PUMP  
PARTS IN CONTAIN-ALL KITS  
SPEEDOMETER CABLE, CASING,  
TIPS, SHAPING  
FUEL LINES & FITTINGS



HYGRADE PRODUCTS CO., INC. LONG ISLAND CITY 1, N.Y.

YOUR

OVERHEAD

1939

1940

1941

1942

1943

1944

1945

1946

IS GOING UP!

OFFSET THIS INCREASED COST OF DOING BUSINESS WITH EXTRA SALES AND GREATER PROFITS ON...

BLUE CROWN

HUSKY



Controlled Heat Zone  
SPARK PLUGS

BLUE CROWN DEALERS  
SELL MORE SPARK PLUGS . . .  
MAKE MORE PROFIT PER PLUG

Dealers sell more BLUE CROWN "HUSKIES" because they are easier to sell . . . have more talking points, more important features . . . give better and longer service . . . make friends who tell others. The controlled heat zone, electrode expansion space, "waist" threading and cementing of electrode are exclusive advantages obtainable only in "Huskies."

In addition to the strong selling features, the dealer set-up has been carefully worked out to give the dealer a better, fairer profit margin in return for his selling cooperation. At this time of high overhead expense, the extra profit on BLUE CROWNS is welcomed by smart dealers everywhere.

The  
Original  
Complete Line  
with Heavy Duty  
Insulators

## AMERICA'S FINEST SPARK PLUG

- The Massive, oversize construction guarantees extra efficiency.
- The Heavy Duty Insulator is bigger and stronger . . . It will not crack "when the heat is on."
- The Heavy Duty Electrodes are huskier . . . for longer life, with fewer adjustments.
- The Controlled Heat Zone insures uniform operation. It provides a definite path for controlled heat dissipation.

*Sold only through Jobbers*



DOMESTIC SALES

BLUE CROWN SPARK PLUG CO.

a DIVISION of MOTOR MASTER PRODUCTS CORP.

1800 WINNEMAC AVENUE, CHICAGO 40, ILLINOIS

EXPORT SALES

Borg-Warner International Corp.

CHICAGO 4, ILLINOIS

Cable Address "BORINTCO"

U. S. A.



## Stray Tips on Spray Painting

(Continued from page 78)

be due to several different things. One is not cleanin' the surface right. Another is not feather edgin' back far enough. And you have the same trouble if you try to put on too heavy coats, or don't let one coat dry enough before you apply another, or try to dry a coat too fast by fannin' the air. And you even get it sometimes from applyin' the primer when the surface is too cold."

Tommy reached for the spray gun. "You got me scared with all those things," he said. "I hope I can remember them."

"It's like everything else in this business," said Pop. "It looks easy to the customer and to the mechanic who don't care. But, if you want to do a first-class job, you've got to know the work inside out and you've got to take time to do it right."

## A VELVET LIKE FINISH IS PRODUCED WITH A FEATHER LIKE TOOL



**CORRECT BALANCE  
CORRECT WEIGHT  
CORRECT DESIGN  
CORRECT SPEED**

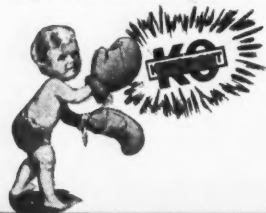
Thirty years manufacturing experience has made it possible for K-O Engineers to give you these four all-important features in a Valve Seat Grinder. These four determining factors are what an experienced mechanic looks for in a Valve Seat Grinder. They're all found in a Knock-Out Grinder.

It doesn't take a master mechanic to produce a velvet-like finish on valve seats. A mechanic with little experience can do it with ease and accuracy when using a K-O Grinder and K-O Stones.

## "Knock-Out" UTILITY VALVE SEAT GRINDERS

are conveniently packed in a handy Tool Chest. This tool will prove to be one of the most worth while and most profitable in any shop. Not only is it built to grind valve seats but also for:

Carbon removing      Abrasive disc grinding  
Tool post grinding      Misc. hand grinding  
and for many other frequent and worth while grinding jobs around a shop.



**MODEL P302 UTILITY VALVE SEAT GRINDER**

**SEE YOUR "K-O" JOBBER OR WRITE TO  
K.O. LEE COMPANY, ABERDEEN, S. D.**

*Manufacturers of Fine Tools for Over Thirty Years*

"But some gyp up the street will do a halfway job and sell it cheaper," said Tommy.

"Sure he will. But I got an answer for these birds who go around lookin' for a better price on paint jobs. I always say, 'Sure I'll guarantee a good finish. But I got to get my price. This is gonna be *your* finish—not *mine*.'"

## Merger of Three Oil Firms Announced

Merger of Freedom Oil Co., Freedom, Pennsylvania, and Valvoline Oil Co., and Galena Oil Corp., both of Cincinnati, Ohio, into the Freedom-Valvoline Oil Co. was announced by William G. Bechman, board chairman of the new company. The consolidation brings together the three oldest independent Pennsylvania refiners of lubricating oil, all of them distributing quality products internationally.

The new company will maintain headquarters in Freedom, Pa., and Cincinnati, Ohio, with offices in 40 cities in this and eleven foreign countries.

Refining activities will be maintained in two plants located at Butler and Freedom, Pa.

The new firm will be one of the largest companies in the Appalachian field, according to Mr. Bechman, who stated that they own and operate approximately 1500 miles of pipe lines.

Officers of the new concern are: William G. Bechman, chairman of the board; Gus P. Doll, vice-chairman of the board and executive vice-president; Earle M. Craig, president; C. J. Leroux, vice-president in charge of sales; B. L. Heath, vice-president in charge of manufacturing; C. Lloyd Archer, secretary-treasurer.

## Raybestos Publishes Employee Manual

"Around Raybestos" is the title of a new post-war employee manual just issued by the Raybestos Division of Raybestos-Manhattan, Inc., in Bridgeport, Connecticut. Although it is hard to find something entirely new in these manuals, this 4½ in. x 6½ in. wire bound booklet has added interest in layout and appearance by using half page photographs of plant scenes instead of the usual cartoons.

Another unique feature is a special supplement for office employees which is included in the front part of the books distributed to them. A four color two page chart showing the nationality, religion, age groups, and length of service of the present working force is also included.

IT'S A SNAP-ON  
...THAT'S ALL YOU  
NEED TO KNOW"

"... take a look, Mac — it's funny how you never lose the kick a good tool gives. When I was still a cub I got smart to what every old-timer knows... the heap of difference that fine tools make. You know — the fun of working with them, and the extra dollars they put in the old pay envelope. Snap-ons taught me that, and Snap-ons keep right on proving it, year after year. And I've saved a lot of time and trouble buying tools the Snap-on way. That's why the Snap-on man is welcome in every shop... he saves our time, keeps our kits in shape... and gives us a chance 'to see and try before we buy.'"

*The complete catalog of more than 3,000 Snap-on Tools is yours for the asking — write for it today!*

**SNAP-ON TOOLS CORPORATION**  
8036-A 28TH AVENUE KENOSHA, WISCONSIN





## They Streamlined Service

(Continued from page 31)

volume again. Direct mail is relied upon heavily here, in the form of letters and circulars designed to sell service to car and truck owners.

Mailing lists are drawn from three sources: company records, manufacturers' owner lists and commercial house lists.

Recently Litsinger's gave a party for its old and new customers and presented 15 acts of vaudeville, two

dance bands, a banquet, and tours through the shop and plant. Thousands of customers attended the gala affair. The customers were selected from their mailing lists, thus illustrating the effectiveness of good mailing lists.

The service department occupies 26,000 square feet of the building and is well planned from a working standpoint. There are no obstructions such

as pillars or posts to interfere with the shuttling of cars, and plenty of natural light comes into the shop from large windows. To cut down exhaust gases, special flexible tubes can be pulled out of the floor to take exhaust direct from cars being worked on.

As cars come into the shop, three service men are assigned to receive incoming jobs. They inspect the cars and determine what repairs are needed and write up the order. Then the jobs are routed to departments or definite mechanic specialists. This system alone saves a great deal of time and assures accurate follow-up.

At Litsinger's, the customer's bill is audited before it goes to the cashier. The auditor verifies all parts numbers, list prices, labor charges and other items which appear on the mechanics' hard copy. The total bill is then figured on electrical calculating machines. This system of advance auditing is estimated to save the firm from \$10,000 to \$15,000 annually through the elimination of forgotten items on customers' bills which so often is the case in many shops.

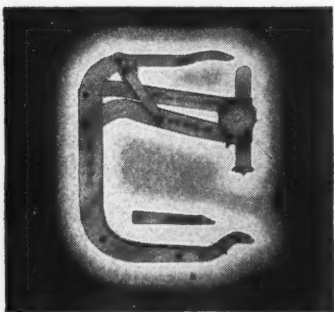
To keep abreast of the trends in car and truck servicing, Service Superintendent Al Corsini studies and reads all the leading automotive trade journals. Copies of the publications are then routed to at least 15 other key men in the organization for their attention.

Twice each month, a meeting is held for the supervisory staff of the service department. Here, new ideas, garnered from trade papers and other publications, are discussed and developed further. By pooling the knowledge of latest service procedure and having it accepted by supervisors, the methods are then put to actual practice in the shop. Cost reduction, specification changes and safety ideas are also treated thoroughly at the meetings.

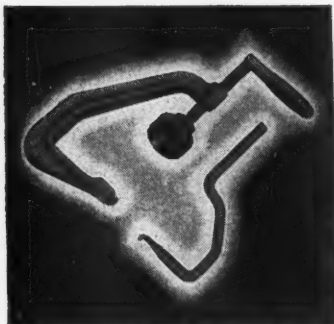
Other types of services offered to customers include: greasing contract, fall and spring combination specials, engine overhauling and complete overhauling. Litsinger's advocates the tying-in of additional work when circumstances permit. For instance, if a customer brings in a carburetor adjustment job, and if the serviceman inspecting the car determines that a complete tune-up is in order, he would then suggest that be done, and would then follow through on each phase of the tune-up work.

There is no labor problem at Litsinger's and the employee turnover is at a very low rate. This is due largely to good sound management, ideal working conditions and pay. Many of the personnel have been with the Litsinger company for 20 years and longer, wearing service pins to denote their length of loyal service to the firm.

Employee morale is kept high be-  
(Continued on page 84)



Developed to service most L- and valve-in-head motors. The most popular and universal C-type Compressor on the market today. K-D No. 380 is rugged, fast and dependable.



Developed especially to pull valve guide assemblies in Ford-built motors no matter how tightly stuck. K-D No. 920 Set (917 Retainer Driver and 918 Puller, as shown) for all motors but 60 HP. K-D No. 860 Set, 60 HP only.



Developed especially for under-fender servicing of motors with low cover openings and low-hung manifolds. K-D No. 900 has 3" parallel lift provided by hinged auxiliary jaws, shown by dotted lines.

# look to K-D

• When special valve service tools were required in the past, K-D made them for you. Twenty-five years of automotive development are recorded by the K-D Catalog. As the new cars come along, bringing new servicing problems, you can again look to K-D for the tools that will make the hard jobs easy. K-D Mfg. Co., Lancaster, Pa., and Hamilton, Ontario.



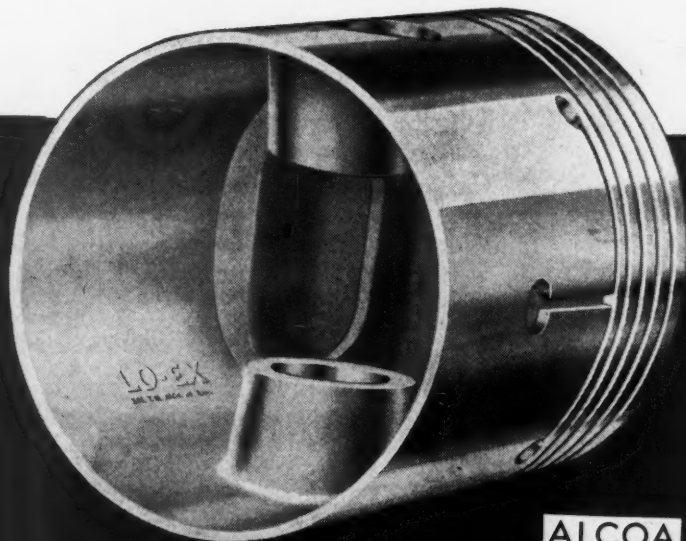


Balance is one of the marks of a  
good piston casting. ALUMINUM  
COMPANY OF AMERICA, 2133  
Gulf Bldg., Pittsburgh 19, Pa.

**LO-EX**

REGISTERED TRADEMARK

**PISTONS OF**



JANUARY, 1946

*When writing to advertisers please mention Motor Age*

## They Streamlined Service

(Continued from page 82)

cause of a number of reasons. Good housekeeping is very evident in this shop. Two porters are at work constantly, cleaning benches, floors and windows, and as a result the surroundings are pleasant for working. Washroom and shower facilities are available for use by the 75 mechanics and are put to good use. There are also individual lockers for use of service personnel.

A good hourly rate of pay, plus an

incentive plan are attractive to Litsinger employees. Included in employee benefits are group insurance, hospital and salary insurance.

Excellent management is keynoted at the Litsinger Motor Co. It is this proper guidance which has contributed to the steady growth in service volume that is gaining this dealership a reputation as one of the outstanding automotive maintenance shops in Chicago.

## NAPA Annual Meeting Held in Cincinnati



Fred E. Nolen

Fred E. Nolen, of Los Angeles, was elected president of the National Automotive Parts Association, at the annual meeting of the organization held in Cincinnati the week of December 10th. Mr.

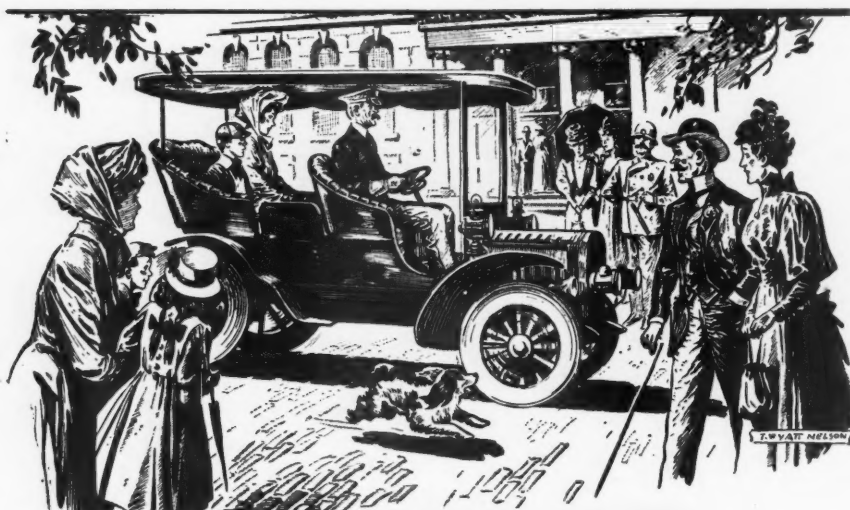
Nolen is vice president and general manager of the Colyear Motor Sales Co., and succeeded in office Earl S. Baldwin, of Columbus, Ohio, president of the Automotive Parts Co. of Ohio.

Henry Lansdale, of Detroit, was re-elected to the office of vice president and general manager of the association, which he has held since 1930.

Howard A. Bradley, Jr. of Philadelphia, was elected vice president of the organization, succeeding Mr. Nolen in that capacity. Mr. Bradley is vice president and general manager of Quaker City Motor Parts Co.

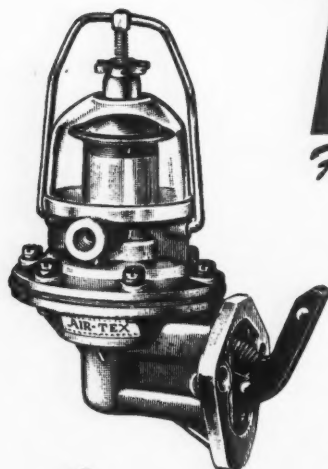
In addition to the officers, all of whom are members of the NAPA Board of Directors, other directors named were as follows: Earl S. Baldwin, Columbus, Ohio; J. H. Baldwin and R. W. Boozer, of Boozer-Test Management Service, Indianapolis, Ind.; A. F. Baxter, Unit Parts Corp., Buffalo, N. Y.; Carlyle Fraser, president, Genuine Parts Co., Atlanta, Ga.; J. F. Wanless, president, Campbell Motor Parts Corp., Boston, Mass.; W. W. Martin, president, NAPA Pittsburgh Warehouse, Inc., Pittsburgh, Pa.; J. R. McCoy, president Quaker City Motors Parts Co., Philadelphia, Pa.; C. T. Reinberger, Cleveland, vice president, Automotive Parts Co. of Ohio, and R. L. Turner, treasurer, Genuine Parts Co., Atlanta, Ga.

## CANOPY AND SIDE CURTAINS



### Remember THIS RAMBLER SURREY?

It was "tops" in 1905, yet would make a mighty poor showing against any of today's models. And it's just as far a cry from the Rambler's old-time, inflexible, gravity fuel feed, to the responsive efficiency of...



## AIRTEX

Factory Tested

## FUEL PUMPS

Properly hardened rocker arms, the hardening and precision grinding of rocker arm pins and correct spring tensions are among the important factors in AIRTEX Fuel Pump efficiency. Others of equal importance are the uniformity and accuracy of body castings, close tolerances on machined parts, the famous AIRTEX diaphragm and the rigid testing of all diaphragm assemblies for gas-tightness.

Assembled with AIRTEX Diaphragms  
Guaranteed for 50,000 Miles



"Airy"-TEX says:

"Your profits climb with the AIRTEX Line"

AIRTEX AUTOMOTIVE CORPORATION, FAIRFIELD, ILL.



"No, he hasn't been smoking cigarettes, but I can smell nothing but whiskey!"



# It's Available Again!



## This Colorful Wagner **CoMaX** BRAKE LINING MERCHANDISER

**Provides Big Coverage  
of 1935 to 1942 Models  
with Few Numbers**

THIS popular six-set CoMaX merchandiser is available again, after having been among the unavoidable "missing" for the past two years.

The merchandiser is available in two assortments which cover practically all 1935 to 1942 models of Ford, Chevrolet, Plymouth, Chrysler, DeSoto, and Dodge (in assortment FL-1025), and Buick, Oldsmobile, and Pontiac (in assortment FL-1026).

This wide coverage makes these assortments unusually fast moving. Your small investment is quickly converted into a good profit.

See your jobber about a Wagner CoMaX 6-set Merchandiser—display one or both in your shop. The merchandiser is a silent salesman; it reminds your customers to have their brakes relined NOW—for quick, safe, smooth stops.

**NOW IS THE TIME TO BUILD FOR THE FUTURE** by making sure your customers are so well pleased with the brake lining *you* furnish that they'll come back to *you* for the next reline and meanwhile tell their friends about the good brake service *you* give.

There are good reasons why Wagner CoMaX builds enthusiastic repeat customers. CoMaX is not just another lining; it is a superior-quality product having the following excellent features: (1) long-lived, (2) reinforced backing, (3) noncompressible, (4) uniform texture, (5) easy on drums, (6) excellent for high speeds, (7) quiet, (8) smooth, (9) ageproof—and of especial importance to you, (10) constantly proved under all climatic and road conditions at Wagner's 26 strategically-located service stations. Get acquainted with Wagner CoMaX brake lining—ask for Catalog BU-128, and address your request to Wagner Electric Corporation, 6498 Plymouth Ave., St. Louis 14, Mo.



**EVERY REPAIRMAN  
needs these two Wagner  
Catalogs.**

Catalog HU-122 gives information on Wagner Lockheed hydraulic brake parts and fluid. Catalog BU-128 covers Wagner CoMaX brake lining.

# Wagner

**LOCKHEED HYDRAULIC BRAKE PARTS AND FLUID... NoRoL  
...CoMaX BRAKE LINING... AIR BRAKES... TACHOGRAPHS  
ELECTRIC MOTORS... TRANSFORMERS... INDUSTRIAL BRAKES**



## Fruehauf Adopts New Suspension

(Continued from page 32)

trailer due to side forces causes the vehicle automatically to bank against such forces. Another feature of the design is that no brake torque loading or horizontal road shocks are transmitted to the torsion bars. Instead, the resulting reactions are transferred directly into the rigid frame, eliminating all tendency to wheel hop or chatter when the brakes are locked.

This freedom of lateral float of the tandem axles permits of automatic steering or trailing of axles on turns of 240 ft radius or greater. This is said to practically eliminate tire scuffing for all normal forward travel and also to reduce the pulling effort on curves as well as on the straightaway.

By virtue of the proper disposition of shackles, the spring rate and frequency is low at light loads and in-

creases in stiffness progressively with increase in load. The geometry of the shackle mounting is such that it is impossible to bottom the load or to overload the torsion bars.

Special attention was given to design details leading to ease of installation, special adjustment, and for maintenance operations. All wearing parts are self-lubricating and sealed for life with the use of O & S pre-loaded self-lubricating bearings. It was observed on test models that no wear occurred on units which had been in service up to 100,000 miles.

Torsion bar mounting has been so designed as to make it a matter of minutes for a complete replacement, or for resetting to meet some special operating conditions. By removing the outer cover, it is possible to slide out the torsion bar without difficulty. Similarly the spring height on either side of the trailer can be adjusted independently to accommodate for eccentric load conditions or for continuous operation on highly crowned roads.

The swinging shackle construction provides a cushion mounting for the body and load which permits them to ride on a level course irrespective of the movement of the axles or of the wheels. In addition, the geometry of the shackles is such as to load the torsion bars in proportion to deflections as well as to limit the maximum load transferred to the spring system. Since road shocks are cushioned both vertically and laterally and true tracking assured on all forward travel, tire life expectancy is said to be greater than with a single axle having equivalent tire size and load.



### THE PARKING LIGHT FEATURE MAKES *Autopart* KITS EASIER TO SELL...

Car and truck owners are quick to recognize the advantages of Autopart Sealed Beam Conversion Kits. Specially engineered features give you the edge on competition... make sales easier, faster... create volume business. Get in touch with your nearest Distributor—or write us.

Furnished  
**COMPLETELY  
ASSEMBLED**  
For Quick and  
Easy Installation

# Autopart

## AUTOPART MANUFACTURING COMPANY

1525 SOUTH MICHIGAN AVE. • CHICAGO 5, ILLINOIS



### Named to Sales Post

Samuel S. Evans, manager of the replacement sales division of Wilkening Manufacturing Co., Philadelphia, maker of Pedrick piston rings and Wilco automotive products, announces the appointment of Don Greene as assistant.



## GET UNDER THE HOOD FOR BIGGER PROFITS

**Ask every motorist, "HOW'S YOUR OIL FILTER?"**

Oil, fan belts, spark plugs, Fram oil filters and replacement cartridges . . . these are just some of the big profit items that lie under the hood. When you open a car's hood, you're opening the driver's wallet!

### How To Get Under The Hood

Don't ask, "Check your oil?" That gives him a chance to say, "No." Instead ask, "How's your oil filter?" Three out of four motorists will answer, "I don't know." That's your cue to get under the hood and find out!

### Make Easy, Extra Sales

First you make the Fram Dipstick Test. If oil is clean, it will *look* clean. But if oil is dirty, he needs a new Fram replacement cartridge in his filter, to keep

motor oil physically and visually clean. Should his car have no filter, it's only a matter of a few minutes to install a Fram Oil and Motor Cleaner. From there on, with the hood open, it's easy to sell him any parts, accessories or services he needs. Fram leads the way to big profits all down the line!

**P. S.** When customers leave their cars with you for oil changes, lube jobs or repairs, check the filter as part of the job. It means *extra* sales!

**FRAM CORPORATION  
Providence 16, R. I.**

*In Canada:*  
J.C. Adams Co., Ltd., Toronto



# FRAM

**OIL & MOTOR CLEANER**  
**THE MODERN OIL FILTER**

# VITALIC

*fan belts  
and  
radiator  
hose*



## The EXTRA FACTOR

in every Vitalic product is the extra experience of the man who makes it. That Continental has done a good job producing war materials is evidenced by the Army-Navy "E" Flag, with three Stars, for sustained excellence in production. ★ Production of Vitalic fan belts and radiator hose is limited only by war activities, and Vitalic jobbers are receiving their full share of war-time production.

SEE OUR CATALOG IN SWEET'S

### BRANCHES

Baltimore, Md.	Cleveland, Ohio	Greensboro, N. C.	Lutz, Fla.	Pittsburgh, Pa.
Boston, Mass.	Dallas, Texas	Hartford, Conn.	Memphis, Tenn.	Rochester, N. Y.
Buffalo, N. Y.	Dayton, Ohio	Indianapolis, Ind.	Milwaukee, Wis.	St. Louis, Mo.
Chicago, Ill.	Detroit, Mich.	Kansas City, Mo.	New York, N. Y.	San Francisco, Cal.
Cincinnati, Ohio	Evansville, Ind.	Los Angeles, Cal.	Philadelphia, Pa.	Syracuse, N. Y.



# CONTINENTAL RUBBER WORKS

ERIE, PENNSYLVANIA, U. S. A.

## Check Your Checks

(Continued from page 37)

Two check forgers, working as a team, were recently apprehended in Chicago. Here is how they worked their particular game. One of the men, after securing the intended victim's blank check and a copy of his signature, would go to the man's bank to cash the forgery. The second fellow would pose as telephone repair man, and time his arrival at the victim's place of business with his partner's entry into the bank. Then after informing the victim that his telephone was being checked on, he would remove the receiver from the hook, while "working" on the instrument. Thus it was impossible for the bank to verify the signature of the check being presented by his co-worker. They could not contact the signer of the check by telephone, and so would go ahead and cash it!

Large insurance companies issue forgery bonds, which cost but a few dollars per year for each thousand dollars covered. Just as accident and liability policies protect you in their way, a forgery bond will cover loss you might incur through either check alteration or forgery. It will pay the full amount of such a loss, dollar for dollar.

## Grey-Rock Announces Return of Personnel

Franklin A. Miller, Grey-Rock sales manager, announces the return of several war veterans to the sales department, and the appointment of a new advertising manager.

A. Ray MacPherson has been advanced to field sales engineer on fleet and industrial products for the east. Frank A. Itgen, Jr., after 4 years and 9 months at war, will take over the North Jersey territory. Mr. Itgen, before the war, was in the sales department at Manheim.

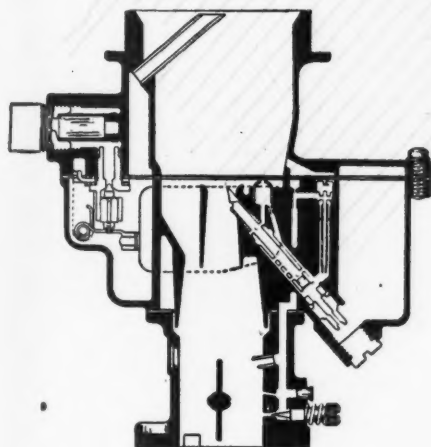
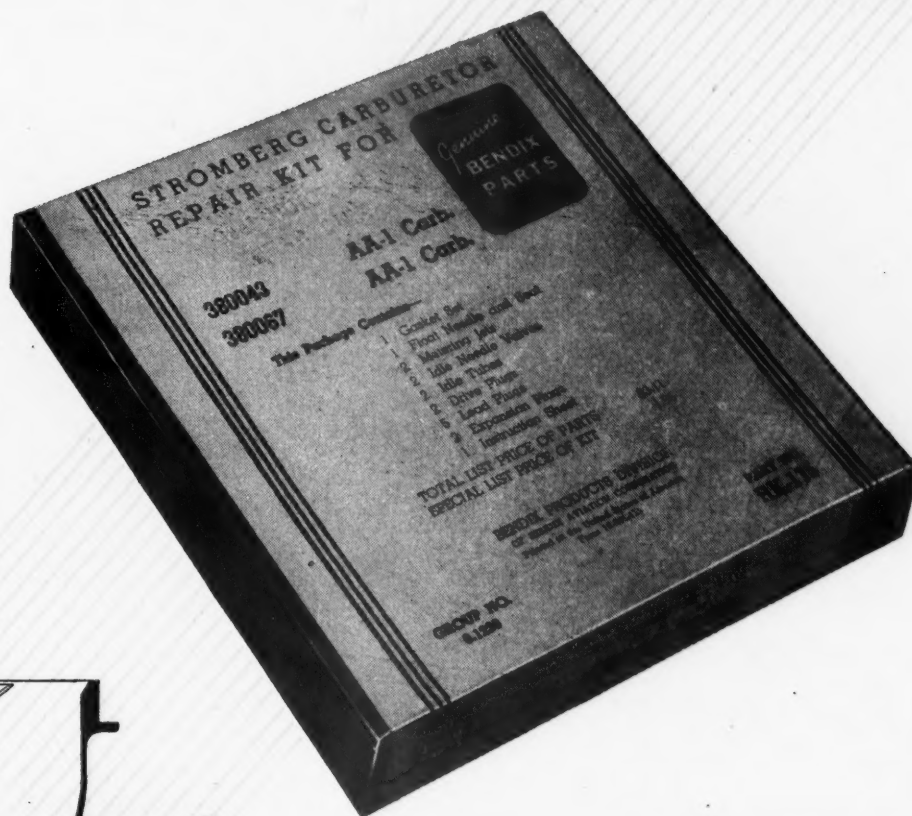
Captain (Ordnance) W. Wade Cloyd returns to take over his old metropolitan New York territory. Victor E. True, after a year and a half in the service, returns to his old Northern California territory. William V. Tracy takes over the Northern New York State territory. Sam R. Robinson comes to Grey-Rock at Manheim with long years of experience in automotive advertising circles as advertising manager.

## Directs Public Relations

Appointment of Fred L. Black as director of public relations of Nash-Kelvinator Corp. was announced by George W. Mason, president. For 23 years, Mr. Black was with the Ford Motor Co. as public relations and advertising executives.



# Genuine STROMBERG PARTS



a complete Stromberg carburetor  
overhaul job—in one package!

Everything you need to make Stromberg\* carburetors perform like new again is available in one complete parts kit. This enables you to do every Stromberg overhaul job right—with genuine Bendix-Stromberg parts right at your fingertips.

It's handy, saves time, and makes a good impression on the customer. So make sure you have plenty of these Stromberg kits in stock. If not, just call your local jobber or Bendix-Stromberg distributor.

**BENDIX PRODUCTS DIVISION • BENDIX AVIATION CORPORATION**

\*TRADE MARK

South Bend 20, Indiana



★ **SAVE TIME—**

**SAVE MONEY**

**USE BENDIX**

**PARTS CLEANER**



**for cleaning carburetor parts**

JANUARY, 1946

*When writing to advertisers please mention Motor Age*

89

## Washington Rulings and Regulations

(Continued from page 54)

7, 1946.

On the storage batteries, the dollar-and-cent ceilings already established for eight different types continue in effect as a base, with the reseller permitted to add freight and costs for refilling and charging the batteries, where such costs are incurred.

The previous ceilings for battery chargers are completely changed. Two ceilings are now established. For

sales by manufacturers to distributors, the ceiling will be \$29.50, less 40 per cent and five per cent, f.o.b. shipping point. For all sales to users, the ceiling will be 175 per cent of the amount actually paid to the Government or manufacturer, but not to exceed \$29.50 each. OPA said this revised pricing was in line with customary trade practice.

*Here's the kind of a Machine you want*

**for GENERAL PURPOSE  
WELDING SATISFACTION  
at low cost**



Model MCT 102  
100 Amperes

Model MCT 202  
200 Amperes

**F**OR a dependable, general purpose arc welder of economical cost—you can't beat Wilson Model MCT 100 and 200 ampere AC Welders.

They get welding jobs done quickly—at extremely low cost. Strength, power and a deep penetrating arc are characteristics of each; engineering brains, expert workmanship, and top quality materials combine to give them real performance.

Continuous, stepless current control, from maximum to minimum, is provided by turning a crank. Current setting is clearly indicated on an easily-read scale and the indicator is readily visible. Unlimited current settings, over the full range, can be made under load or idling.

Ask your nearest Airco office—or write Dept. MG for descriptive bulletins. Address Air Reduction, General Offices: 60 East 42nd Street, New York 17, N. Y. In Texas, Magnolia Airco Gas Products Co., General Offices: Houston 1, Texas. Represented Internationally by Airco Export Corp.

**AIR REDUCTION**

Offices in All Principal Cities



**WILSON MODEL MCT**  
**a.c. ARC WELDERS**  
A COMPLETE LINE OF AC, DC. AND GAS ENGINE DRIVEN UNITS

## Seat Cover Price Order Is Broadened

**T**HE price order issued in September 1945 to encourage production of relatively inexpensive automobile seat covers has been broadened to cover several situations for which no specific provision was made in the original draft, the Office of Price Administration said recently.

Affected are seat covers sold by manufacturers at prices below certain cut-off points specified in the order. As the order was written, it had the effect of limiting the adjustment rights to established manufacturers selling in this price range, and at a loss, such manufacturers were permitted to apply for an increase to bring the ceiling price up to total cost of production and sale plus their own average peacetime margin, so long as this price did not exceed the applicable cut-off price, OPA said.

The new action, which became effective December 28, 1945, permits manufacturers who did not produce seat covers in a normal peacetime period, or whose margin in such a period was below 7.2 per cent, to apply for an adjustment that would include total costs plus a margin of 7.2 per cent, OPA said.

The cut-off prices listed in the original order applied only on manufacturer sales direct to retailers, OPA said. The latest action adds a list of cut-off prices on sales to jobbers. Manufacturers who sell to jobbers at prices below these cut-offs now have the same adjustment privileges as manufacturers who sell direct to retailers.

## CPA Announces Policy for Ratings on New Trucks

**T**HE Civilian Production Administration recently announced the policy by which ratings for obtaining new trucks will be granted. Ratings will be given only to producers of, or those intending to produce, materials that CPA has found to be in such tight supply as to be a serious threat to the civilian economy.

This action was effected by Direction 6 to Priorities Regulation 28.

A CC rating issued for a truck can only be applied to a distributor or dealer and is not extendable, by him or by the holder, to a manufacturer, CPA officials said. Not covered by the order are station wagons, coupes fitted with pickup boxes, ambulances, hearses, taxicabs or integral type buses.

It was also explained that a CC rating will be denied where it appears that the new truck for which the rating is requested is available, but under different terms of sale or from a supplier other than the applicant's customary supplier.

# Introducing PEE-WEE, the Little Injun from the Thompson Tepee



"Look! Now that overgrown papoose is goin' to tell me how to fix up cars!"

"Don't grouch, Pete. Pee-Wee's a swell little guy and very wise for his years. You can learn things from Pee-Wee—and get a grin at the same time."

Repairmen throughout the nation  
Have enjoyed profitable relaxation,  
In reading Thompson Products ads  
Which utilize two different lads.

There's rough and ready Patchwork Pete,  
Whose crabbing is often indiscreet;  
And T. P. Tim who represents  
A skillful man with good, hard sense.

He cautions Pete against makeshift ways  
And proves it's expert work that pays;  
That fine parts installed with skill and care  
Are requisites to good repair.

To this duo we now add  
A happy little Indian lad.  
We'll try to have him take his turn  
So you may read, and  
**LAUGH and LEARN!**

"Ugh! Pete, keep 'um eyes and ears open and mouth shut, he do much better. See good medicine Thompson making for cars!"



## Thompson

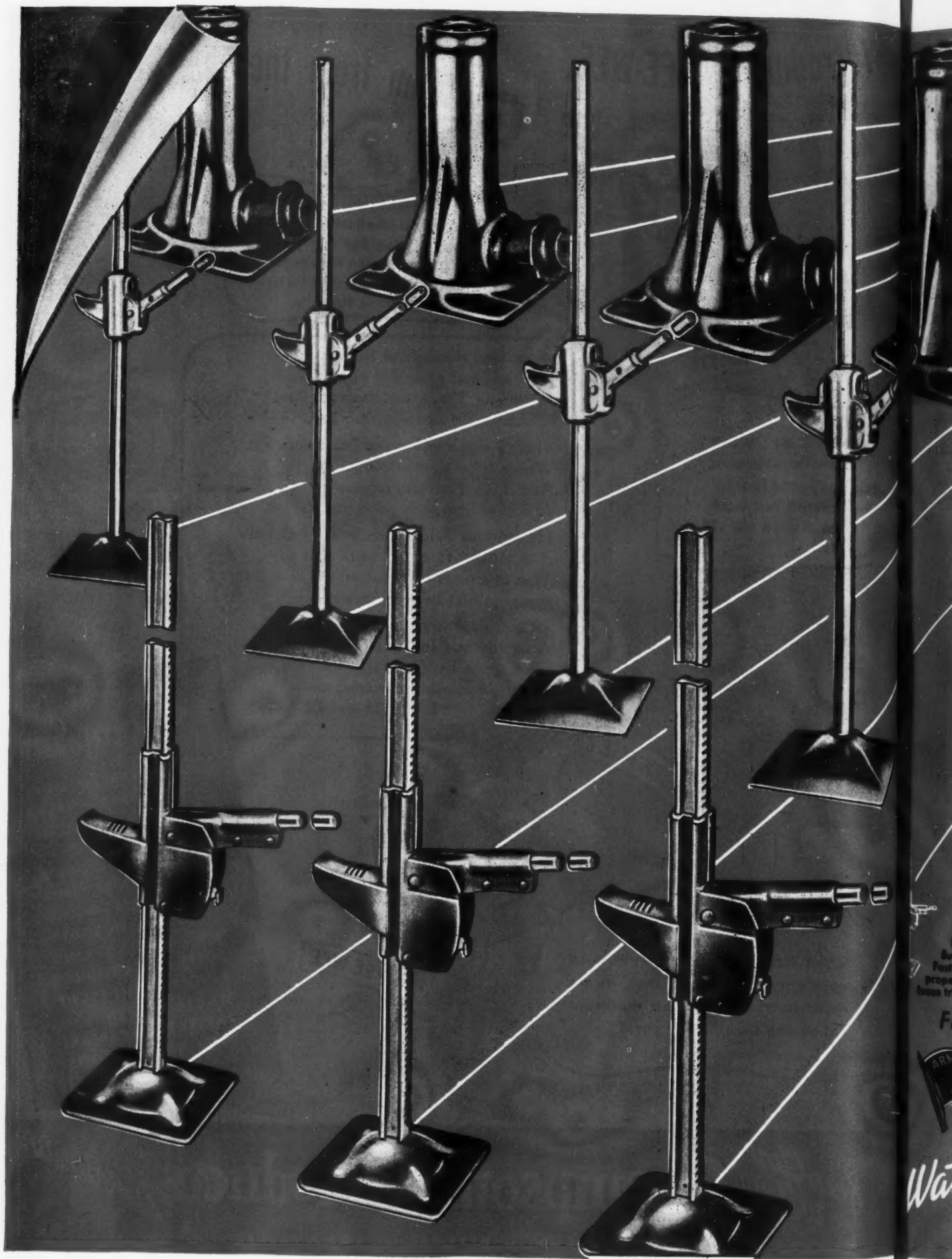
VALVES • VALVE GUIDES  
• VALVE SEATS • VALVE  
RETAINERS • ENGINE  
BEARINGS • PISTONS •  
PISTON PINS • CYLINDER  
SLEEVES • WATER PUMPS  
• PUMP PARTS • SPRING  
SHACKLES • TIE RODS •  
KING PINS • SPRING  
BOLTS AND BUSHINGS  
• INDEPENDENT FRONT  
WHEEL SUSPENSION  
PARTS • ENGINE BREAK-  
IN OIL • WHEEL ALIGNERS

Keep Close  
to Your

**Thompson**  **Products** *Distributor*

CLEVELAND • DETROIT • LOS ANGELES





# Look to AUSCO

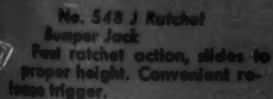
For the Latest in Mechanical Jacks



**No. 373 J**  
Screwtype Axle  
Large, heavy steel base,  
easily placed, "stays  
put." Telescoping steel  
tubes protect and help  
guide screws to extreme  
heights. Fits under low  
axles, gives ample lift for  
complete clearance. Com-  
pact.



**No. 650 J Friction**  
Bumper Jack  
Friction type, sure and sim-  
ple. Lifts "way up" in a few  
strokes, lowers quickly, eas-  
ily. Completely rust-proofed.  
No ratchets, gears, to wear  
or collect dirt.



**No. 548 J Ratchet**  
Bumper Jack  
Fast ratchet action, slides to  
proper height. Convenient re-  
lease trigger.

**Fully Covered by Patents**



# Watch AUSCO

for the LATEST in Mechanical and Hydraulic Jacks

AUSCO Trademark Registered U. S. Patent Office

The new Auscos have the look, the action, the quality and the price that will please you, and a big waiting market—as you'll find out the minute you display them. Wartime experience on every front—following Ausco's previous 20 years of original equipment and replacement jack experience—make the coming Auscos *LEADERS* in a line of leaders—a challenge to the field, and an opportunity for you. **AUTO SPECIALTIES MANUFACTURING CO.,**

St. Joseph, Michigan . . . Windsor, Ontario, Canada.

## Butyl Tubes Prove Successful

(Continued from page 41)

can take considerably more punishment. For instance, in one test a Butyl tube after running 35,000 miles was punctured with a tenpenny nail. Despite this, enough air remained in the tube to permit the driver to run several miles before bringing the car to a stop.

The tensile strength of Butyl, when compounded for tubes, is said to be less than that of natural rubber. Yet this does not appear to be a disadvan-

tage since service reports indicate perfectly satisfactory results in military use. Tear resistance is as good as that of natural rubber and probably better, according to some reports. It is said to compare favorably from the abrasion standpoint, this being reflected in the ability to stand up at the "toes" of the tire beads where failures occur occasionally in normal practice.

One tire manufacturer reports on

aging tests showing service life equal to that of natural rubber. In one test conducted by this company, boxed tubes were aged in an oven for 24 hours at a temperature of 100 degrees Centigrade, then taken out and mounted in tires. They were then run 10,000 miles without any evidence of a failure. In the opinion of the expert, this type of test proves that Butyl is as good as natural rubber and if anything, superior to it from the standpoint of aging.

Now as to the elastic properties of Butyl—stretchability, flexibility, and permanent set. Some observers believe that the Butyl tube stretches out of shape and size and takes a permanent set, gets flabby. If that is true, then a tube after some period of service would no longer fit the original tire. There has been some fear, too, that if a Butyl tube is over-inflated for repairs it might grow in size and no longer fit the tire from which it was removed. Such behaviour would be detrimental and should tip the scales in favor of natural rubber, if true.

What are the facts as far as they are known? While the tire experts do not agree on the exact details, it is apparently true that Butyl does stretch out more—grow to a larger size—than does rubber. How much more is a question no one can answer too positively. One expert says that a natural rubber tube designed to stretch properly into the correct casing takes a "set" roughly half way between the molded size and the inside of the tire. Butyl tubes, on the other hand, set themselves fully to the container size. Consequently, if Butyl were to grow it would no longer fit the original casing.

The general experience is that although the Butyl tube does take on a permanent stretch under average operating conditions, it does not get out of shape enough to prevent its use in the original tire.

Speaking of getting out of shape,

(Continued on page 100)



A SOAX carburetor is a clean carburetor . . . SOAX is a cold immersion DIRECT ACTION cleanser that gets right down to the metal . . . removes carbon, grease and dirt . . . will not harm even soft metals . . . is easy on the hands . . . is NON-combustible. Try SOAX in your shop. . . . Write us today for complete technical data and prices, or ask your jobber.

**E. A. GERLACH CO.** 410 BEURY BLDG., PHILA. 40, PA.  
MFRS. OF 70 STRIPPER . . . JELZINE . . . SPRUCE JELL . . . SOAX



"—and there I was, see—alone on an island with dis gorgeous dame!"



This  
month  
we're  
telling

39,477,228

people  
about

RAYON  
CORD  
TIRES!



## A new chapter in the history of tires



Out of the laboratory test tube, through the fury of war, RAYON CORD takes its place at the head of the list of revolutionary advances in tire-making.

Rayon tires kept our Armies rolling on to Victory—saved many a G.I.'s life on the far-flung battlefields of the world. Soon you'll be rolling on rayon too—and what an experience you have in store. Tire makers say that never will you have ridden so safely, never so comfortably, never will you have enjoyed so much trouble-free mileage.



From Fashions to Fighting—Maybe you know how rayon, long in the forefront of the fashion picture, went to war. Exhaustive tests and wartime performance definitely proved rayon superior, whether used with synthetic rubber, natural rubber, or combinations of both.



**Why Rayon Cord Tires are Better—**Because rayon production is entirely within human control, and is not subject to fickle Nature, it can be given properties of strength and uniformity only possible through scientific production. Here are some of the advantages you can look forward to in tires of rayon:



**GREATER SAFETY—**Heat is the enemy of tires. Because rayon cord tires run cooler, and the cord actually gets stronger as their temperature rises, road failure is greatly reduced. Reports from the Army and bus and truck fleet operators show there are fewer blowouts and road failures when they use rayon cord tires.

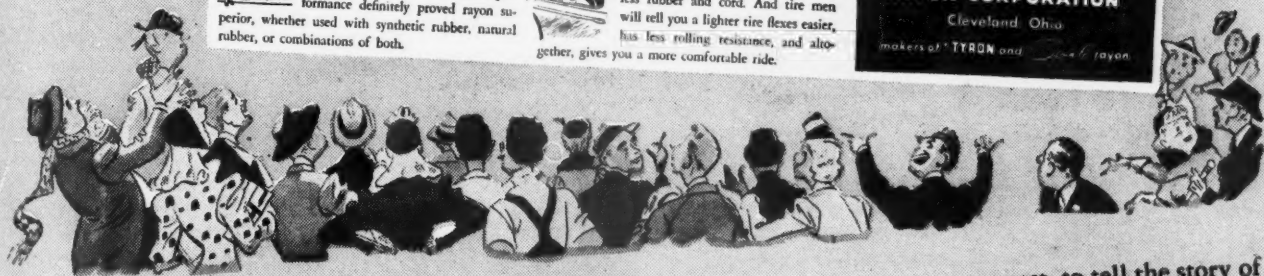


**MORE COMFORT—**Because rayon cord has greater strength per unit of weight, tires of rayon can be lighter, requiring less rubber and cord. And tire men will tell you a lighter tire flexes easier, has less rolling resistance, and altogether, gives you a more comfortable ride.



**LONGER LIFE—**With heat breakdown reduced, rayon cord tires will give you greater mileage. How much greater depends on car, driver, roads but, truth be told, you'll probably be riding on the same set of rayon cord tires as long as you keep your car.

**Industrial Rayon's TYRON—**A leader in the manufacture of rayon for tires, Industrial Rayon is proud of its major contribution to this important development. Our Tyron, a rayon cord of unmatched excellence, is produced by an exclusive Continuous Process to provide the ultimate in uniformity. To tire manufacturers this is an ideal—a cord that is uniform today, tomorrow, next year—spool after spool, and hence tire after tire.



SMASHING full-page messages are running in the

Saturday Evening Post      Colliers  
Look    Liberty    American Weekly  
American Magazine      Fortune

and in large space ads in more than 100 newspapers

in major cities from coast to coast, to tell the story of this modern miracle, the rayon cord tire.

As producers of Tyron rayon tire cord, Industrial Rayon is proud to have played so important a part in the development of high-strength rayon—and pleased to tell Americans about these new, safer, better, longer-wearing tires of their motoring future.

**TYRON**

rayon for tires

Made by INDUSTRIAL RAYON CORPORATION  
Cleveland, Ohio

# Legally Speaking

A lawyer's interpretation of federal and local court decisions of interest to repairmen and car dealers

## Legal Merchandise

SOME kinds of merchandise are so rigidly regulated by law that an item which does not meet the legal requirements is said to be illegal merchandise. A merchant found selling

such illegal merchandise may be subject to severe penalties, according to the statute of the particular state or the local ordinance of the town or city in which he is doing business.

In New York recently, a merchant refused to pay for certain goods on

the ground that there was an express warranty that the goods would be fit for the purpose intended, that is, resale to the retail trade, and that they were not suitable for that purpose, because they did not comply with the provisions of statutory law governing that particular kind of merchandise. The court agreed with the merchant and decided that he was not obliged to pay for the goods under these circumstances. Quoting legal authority, the court said:

"Generally, the requirement of merchantable quality carries with it no implication that the goods shall be salable in a particular market, but under some circumstances may include compliance with the requirements of a particular market."

Merchantable quality means ordinarily that the goods are fit for sale in the course of business. However, where local law requires that the goods meet certain specified requirements, they are not merchantable if the local requirements are not met—for in such case, the merchant cannot sell them without violating the law.

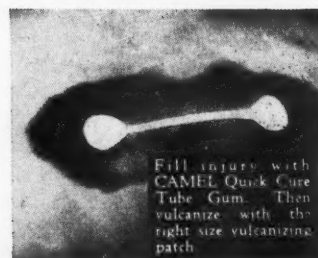
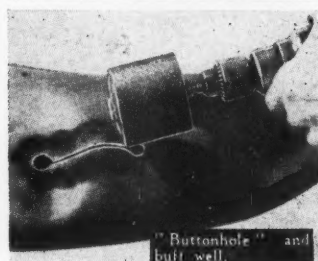
Such laws governing merchandise are frequent in the case of food items, but they are sometimes found in connection with other types of merchandise also. These laws often specify material, ingredients, dimensions, construction, weight and other features of particular kinds of merchandise. Retailers should make it a point to be familiar with any such legal requirements in their respective states and towns. The fact that a merchant may be selling illegal merchandise innocently or through ignorance, does not help him much when he becomes entangled with the law. (*Lash vs. A. C. Ogden*, 297 New York Supplement, 1008).

## License Limits

REPAIRMEN taking out licenses, or permits for business purposes in their local communities, should make sure that such licenses include all business activities in which the repairman wants to engage. A license that is too limited may deprive him of a very profitable source of business.

Such was the unpleasant result in a recent case in which a retailer was granted a license to sell and deliver in certain communities adjacent to his place of business. Six months elapsed before he noticed that the license did not permit him to deliver goods in a

(Continued on page 98)



**Right** ... because  
**CAMELS patch both synthetic and natural rubber** **Right**

CAMELS are the right patch because every step in their manufacture is controlled. The rubber is actually made in our own plant to our own formula. The perfected heat element gives a high, sustained heat that properly cures the rubber. For more than 23 years the same management of the same company has backed CAMELS with the same unqualified guarantee of satisfaction to both repairman and customer. CAMELS are old friends back from the wars, ready to serve the millions who have used them, and the new driving generation.

CAMELS are right for both synthetic and natural rubber tubes. The right way to repair an injury is the CAMEL way as illustrated.

This new hermetically factory-sealed package is absolutely water repellent. This insures a perfect rubber patch and heat element when used.



Look for the familiar CAMEL package anywhere!



**CAMEL Patches**  
H. B. Egan Manufacturing Company, Muskogee, Oklahoma  
In Canada: GEORGE M. WATSON & CO., Ltd. Toronto, 2

Other CAMEL Products available in the complete line are: Quick Cure Gum, Tube Repair Kits, Garage-size Kits, Vulcanizing Cement, Rubber Cement, Tire Patch Cement, Vulcanizing Kits, and Valve Stem Heat Units.





Reading time: 1 minute, 52 seconds

As a kid in knee pants, Speedy was always going "off to the races." They were the famous Elgin Road Races where he soaked up the talk and hustle of heroes like Teddie Tetzlaff, Eddie Rickenbacker, Barney Oldfield and the rest. Then, during high school days, Speedy got the thrills of a steering wheel himself. He drove a delivery truck for a feed company after school.

One day Speedy was met by the owner of a big estate who had a sign at his entrance that said, "No Agents Allowed." Speedy said, "Mr. Brown, if I respect that sign I'll never be able to sell you any feed." The man laughed and said, "Young man, I could use a salesman like you in my shoe business, here's my card." The morning after high school graduation, Speedy was on his way to Chicago and his new job with Mr. Brown. His Dad, the local piano tuner, said—"Speedy is off to the races again."



For three years Speedy traveled several states calling on the retail trade, selling shoes, saving money. He did a lot of his traveling by automobile, covered more miles and called on more trade than any other salesman. In three years he saved five thousand dollars and decided that automobiles were really the love of his life and, as he says it, "we decided to get married."

Speedy invested his savings and joined up with the Dodge dealer in his own home town. He set a swift pace as a salesman, became friends with the local bankers who saw in Speedy a real hustler with a future. After

five years of partnership, Speedy bought his own dealership in a neighboring town. Again he set a winning pace. Success came. In 1941 Speedy and his staff sold four hundred new cars and trucks and over a thousand used cars. Then came the war and again Speedy was "off to the races."

Speedy joined the Army. Went first to Africa as a major of ordnance, then to Europe where they made him a full colonel at the fall of Berlin. If you ask Speedy about his war experience he'll tell you that the greatest race he ever saw was the vast American ordnance race across the Rhine and beyond. For his own part in it he got three battle stars, a bronze star, and his colonel's promotion.



Back home after 22 months overseas, Speedy will tell you his biggest thrill is to be back to the love of his life, automobiles. He tells you proudly that during his absence his organization gave expert wartime service to Dodge and Plymouth cars, and Dodge Trucks. A beautiful new salesroom of stone and glass (with a 90-foot show window) is now going up, and they're excavating for a big service addition. Ask Speedy about the future and he'll tell you, "We're doubling our facilities and we'll double our business when the new cars and trucks start rolling our way."

NOTE:  
This is another true and typical story of individual initiative and productive enterprise, taken from the records of the Chrysler Corporation.



**CHRYSLER CORPORATION**  
**PLYMOUTH \* DODGE \* DE SOTO**  
**CHRYSLER \* DODGE Job-Rated TRUCKS**

REMEMBER THURSDAY NIGHT! The Music of Andre Kostelanetz and the musical world's most popular stars—Thursday, CBS, 9 P. M., E. S. T.

KEEP ON BUYING VICTORY BONDS



## Legally Speaking

(Continued from page 96)

certain nearby community. He then took legal action to have the license broadened to include this community in which he had made deliveries in the past. The application to enlarge the license to that extent was refused, the court saying:

"The petitioner desires a removal of all limitation in its license so that it may sell and deliver in a certain nearby village. In the application for the license, no statement was made

that it was desired to do business in that village. The application was not for an unlimited license and since it was not specified that it was intended or desired to sell and deliver in that village, the petitioner is not entitled to the removal of the limitation. By accepting the license as issued and without any protest against the limitation for six months, the petitioner is estopped to now question the provisions of the license."

"Estopped" is a legal term meaning that a person is prevented from claiming a right or privilege which he might have obtained if he had asserted it at the proper time. Delay in asserting a right or in protesting against the withholding of the right, is a frequent ground in the law for the so-called "estoppel."

Which suggests that a repairman should make sure that his applications for licenses and permits include everything he wants them to include. Moreover, he should carefully examine licenses and permits issued to him to make sure that they cover all his business needs and requirements. (*Sheffield vs. TenEyck*, 299 New York Supplement, 340).

## Repairman's Contract

**M**OST repairmen entering into a contract assume that all the terms affecting their rights and obligations under the contract are set forth in the contract itself. A recent South Carolina court decision serves as a reminder that this is not necessarily so. In every contract there are "invisibly written clauses" just as important as the written ones—and sometimes more so.

Those invisible clauses in every contract comprise the law existing at the time the contract is entered into. In other words, every contract made by a repairman is said to be in contemplation of existing law. This means that in any litigation involving the contract, the outcome will depend largely upon the law applicable to the contract at the time it was made. The "invisible" legal clauses in the contract, therefore, may be much more important to the repairman than the terms of the contract itself. As the South Carolina court puts it:

"Everyone is presumed to know the law, and the law becomes part of every contract."

Which suggests that before a repairman enters into an important contract, he should not only know what the terms of the contract are, but should also inform himself with respect to the law applicable to it. (*Geiger vs. Ashley*, 193 South Eastern Reporter, 192.)

## Lempco Products Forms Automotive Division

In order to provide improved service, as well as the merchandising of replacement parts, Lempco Products, Inc., has formed a separate automotive division. This division has moved to its new quarters at 2953 East 55th Street, Cleveland 4, Ohio. George J. Barsa, who has been with Lempco for seventeen years, will continue as general manager of Lempco's new automotive division.



## FOR YOUR PROTECTION!

This trade-mark on every Wayne product means a full measure of value and service. It means the product is Wayne engineered and Wayne built. There's a Wayne Compressor for every automotive need, from 1/4 H. P. to 10 H. P. Write today for complete line catalog filled with useful information.

THE WAYNE PUMP COMPANY, FORT WAYNE 4, INDIANA

**WAYNE AIR COMPRESSORS**  
GASOLINE PUMPS • CAR WASHERS • AIR SCALES • REELS • LIFTS

"HE  
PROFITS MOST  
WHO  
SERVES  
BEST"

In the brake-service  
field, you serve best with



# WAGNER LOCKHEED

## Hydraulic Brake Parts, Kits, Assortments, and Fluid

Your customers *deserve* the best, and you have everything to gain by supplying them with the best.

When it comes to hydraulic brake parts and fluid—it pays to use genuine Wagner Lockheed Hydraulic Brake Parts and Fluid.

As a pioneer in hydraulic brakes, and as manufacturer of Lockheed Hydraulic Brakes for original equipment as well as hydraulic brake parts and fluid for service needs, WAGNER *knows* what qualities are required.

Wagner Lockheed Hydraulic Brake Parts are available in factory-sealed kits or as individual parts, and cylinders are available completely assembled or by individual parts.

Wagner Lockheed No. 21 is an *all-season* fluid for *all* hydraulic brake systems. It retains its highly efficient qualities under all driving conditions. It completely and properly mixes with all other approved

fluids, furnishes necessary lubrication for working parts of the hydraulic brake system, and, in general, preserves the essential characteristics of the entire system.

For details, consult nearest Wagner jobber, or write us. Ask for copy of Catalog HU-122. Also ask for Catalog HU-17 "How to Bleed and Refill Hydraulic Brake Systems." Wagner Electric Corporation, 6498 Plymouth Ave., St. Louis 14, Mo., U. S. A.



# Wagner

LOCKHEED HYDRAULIC BRAKE PARTS and FLUID...NoRoI...CoMaX BRAKE LINING...AIR BRAKES...TACHOGRAPHS...ELECTRIC MOTORS...TRANSFORMERS...INDUSTRIAL BRAKES



Remind your customers "BRAKE FLUID SHOULD BE CHECKED TWICE A YEAR"



## Butyl Tubes Prove Successful

(Continued from page 94)

don't overlook the fact that natural rubber tubes stretch too, in fact, they can't stand as much heat as does Butyl. Whereas, natural rubber tubes can be ruined by too much heat, Butyl can take it and continue to operate without failure. That scores an important point for Butyl in real heavy duty service.

Before the war the tire people used to stress the necessity for matching a new tube with a new tire. But it was

common practice to continue the use of an old tube, nevertheless, and you got away with it. With Butyl tubes, it becomes imperative to fit "a new tube with a new tire" owing to the stretch taken on over a period of time. So that's the limitation of Butyl. You can judge whether it's important enough to consider in view of the known advantages over rubber.

With Butyl proper lubrication to prevent localized stretching and thin-

ning is imperative. So much so that the manufacturers have developed lubrication practices at the factory which take this important feature out of the hands of the user.

Some people have expressed the fear that the over-inflation of a Butyl tube during repair may ruin it and makes it impossible to replace it in the original casing. According to the experts this fear is groundless. In the first place over-inflation of a free tube does not impose enough stretching—does not overload the tube sufficiently—to cause it to change dimensions or shape. While it is true that a used Butyl tube will not fit a new tire, because of its increased out-of-shape condition, with reasonable care the used tube mounts satisfactorily in a used tire. Flats or other temporary failures can be repaired without ruining the fit of the Butyl tube in a used casing.

On the other hand natural rubber has other serious disadvantages. Buckles or folds introduced in a natural rubber tube in mounting will promote early failure. Yet the same buckles or folds will not affect the serviceability of a Butyl tube. So you can score another point for Butyl.

It may be well at this time to stress that Butyl tubes have been earmarked exclusively for military use up to now. Such tubes have not been available for civilian use and, consequently, repairmen cannot judge performance on the basis of their own experience. At this writing, some cut-backs in military requirements plus the availability of more Butyl, make it appear that Butyl tubes now will be made available for civilian use in limited numbers at first and growing in volume as time goes on.



## "Just what the Doctor Ordered" for WINTER-AILING MOTORS!

Cold weather is hard on automotive water pumps. For prompt and profitable service to your trade, stock Bulldog Water Pump Repair Kits *now!* Kit contains everything that goes into a pump assembly except the cast-iron body.

Available for most popular makes and models of cars and trucks since 1936. Immediate deliveries.

### SEND FOR BULLDOG CATALOG AND COMPLETE PRICE LIST

Our 100-page Bulldog Indexed Catalog and Dealer Price List available on request. If you do not have a copy, write for this Catalog and Price List today. Address: Dept. MA-1.



# JAMBOR



**Tool and Stamping Co.**  
3057 NORTH 30th STREET  
MILWAUKEE 10, WIS., U. S. A.

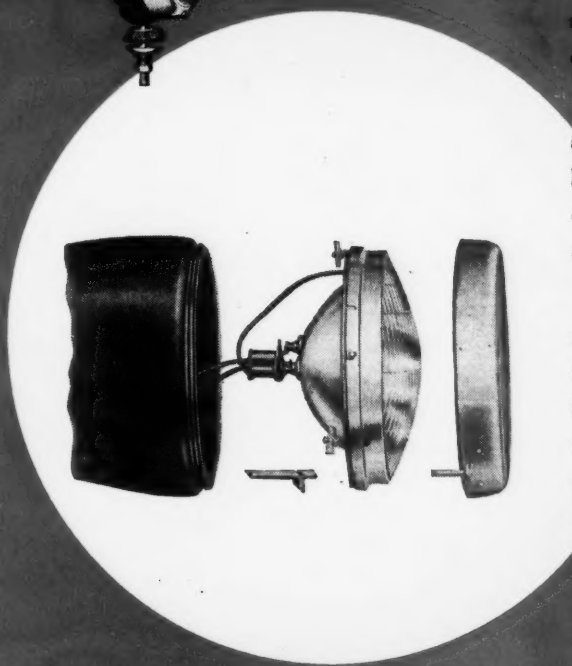
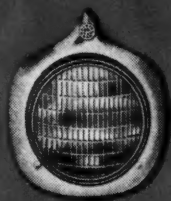
## Folder on Gasoline Hose, Fittings Issued

A new folder on its gasoline hose and fittings has been published by The B. F. Goodrich Co., Akron, Ohio, and is now available upon request. The folder describes and pictures the operating advantages of its tank truck hose with oil and gasoline proof synthetic rubber tube and cover, as well as all the fittings needed for its use.

## Appointed Zone Manager

Appointment of John C. Jamieson as Dallas Zone manager of Pontiac Motor Division has been announced by D. U. Bathrick, general sales manager. He succeeds Allen Wright who has been Dallas Zone manager from January, 1942, to the time of his death on November 17. Jamieson has been with General Motors since 1932 and with the Pontiac Division since 1934.





## ARROW Sealed-Beam Conversion Kits for "Safety After Dark"

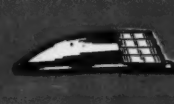
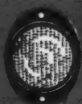
### a kit to fit each make and model

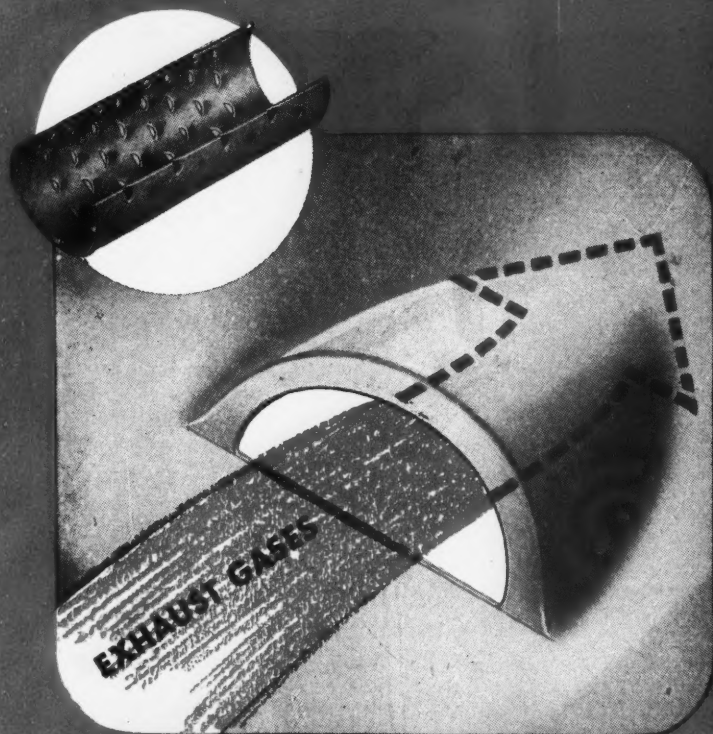
Arrow—the initial and foremost manufacturer of Sealed-Beam replacement kits, offers custom-built installations for practically all pre-1940 cars, trucks, and busses. Precision-engineered to fit the headlights perfectly . . . sturdily constructed to stand up under the toughest operating conditions, and handsomely finished, Arrow conversions look as good or better than the original headlamps.

Every Arrow Kit is a complete set of all parts required to change over both headlamps to Sealed-Beam lighting, including two Mazda Sealed-Beam units, sockets, and wire.

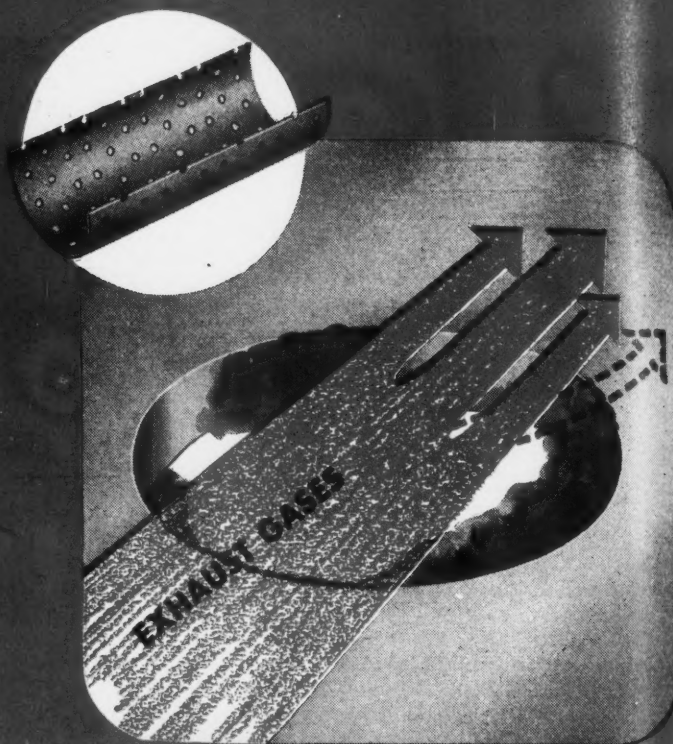
You can perform a vital service to your customers and your community, and at the same time increase your profits, with Arrow Safety equipment. Arrow complete Sealed-Beam Headlamps are also available with bottom-stud and rear-stud mountings where conversion-kits are not practical. Ask your jobber salesman, or write direct. Arrow Safety Device Co., Mount Holly, N. J.

SAFETY  
**ARROW**  
DEVICES  
SAFETY AFTER DARK





**PRATT EXCLUSIVE**  
*Self-Cleaning* **SCOOP ACTION**  
**CAN'T CLOG!**



**CLOGGED PERFORATIONS**  
**IN OTHER MUFFLERS**  
**REDUCE EFFICIENCY**



## **IT'S EASIER TO SELL THE** *Self-Cleaning* **MUFFLER**

Plan now to add your name to the steadily growing list of successful dealers who are building greater sales and profits with the PRATT line of replacement mufflers.

Get the facts about PRATT'S exclusive self-cleaning, *can't clog* Scoop Action and patented Spiral construction . . . Check the many other "talkable" and "showable" PRATT features . . . Then you'll know why leading dealers say:—

**"It's Easier to Sell PRATT Spiral Mufflers"**

Ask any PRATT Distributor for literature and complete information

**PRATT INDUSTRIES INC., FRANKFORT, N.Y.**

In Canada: **PRATT CHUCK COMPANY, Ltd., Toronto, Ont.**

Pratt Replacement Mufflers are sold only through jobbers.

*Join the Profit Parade with Pratt Spiral Mufflers  
and watch your Muffler Sales Pyramid.*



Pratt muffler shells are fabricated from cold rolled steel with spiral, 4-ply interlocking, re-inforced ribs. This exclusive, patented Pratt construction produces mufflers of great strength and rigidity with outstanding eye and buy appeal.



Pratt Spiral Mufflers are approved by  
Underwriters' Laboratories, Inc.

# **PRATT** *Spiral* **MUFFLERS**

**DIFFERENT . . . BETTER . . . FASTER SELLING**

## Bear Co. Announces Personnel Appointments

Appointment of three engineers, a personnel manager and two district representatives to the staff of the Bear Manufacturing Co., makers of automotive wheel alignment and balancing equipment at Rock Island, Ill., was announced by Will Dammann, president.

Dammann also announced the return of Brigadier General Ian Cumberland, Toronto, Canada, of the Fifth Canadian Armored Brigade as the Bear representative in Eastern Canada, and William O. Merritt, Rock Island, a Naval lieutenant (junior grade), as director of public relations.

New members of the firm's engineering staff are Harold O. Holaday of South Bend, Indiana, James O. King of Paterson, N. J., and Elmer Benson of Moline, Ill.

The new Bear representatives are Walter M. Booth and Roy V. Cosner. Booth has the Indiana-Kentucky district and Mr. Cosner is representing Bear in Washington and Oregon.

The new personnel manager for the company is Carl Hoefker, Rock Island.

## White Plans \$9 Million Plant Expansion Program

A heavy expansion program in which the White Motor Co. will spend some \$9,000,000 during the next 18 months for machinery, equipment, and plant additions, was announced by Robert F. Black, president of the company, at a meeting of the organization's "Five and Twenty Club" recently. This club is made up of employees who have been with the company for 25 years or more. Over 700 employees (approximately one in every eight) are eligible for membership—an unusual record of long-time employment.

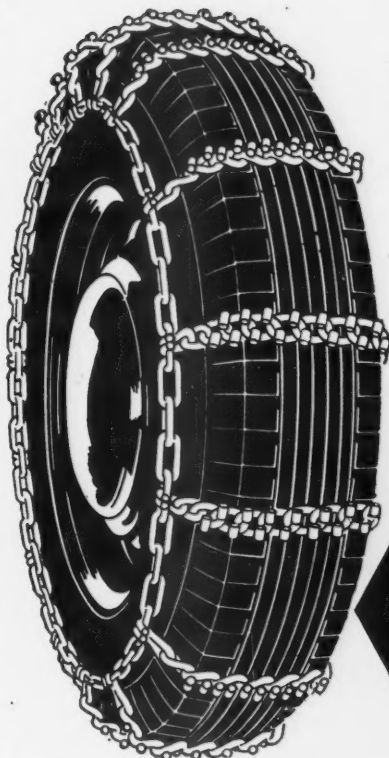
In making the expansion announcement, Mr. Black pointed out that the company has a truck production schedule calling for the manufacture of 18,000 units in 1946, a schedule based on material commitments already made. This means a doubling of production. A heavy backlog of orders insures the market for years to come, Black stated.

## Appointment Named

The appointment of George F. Bluth as assistant works manager of Willys-Overland Motors has announced.

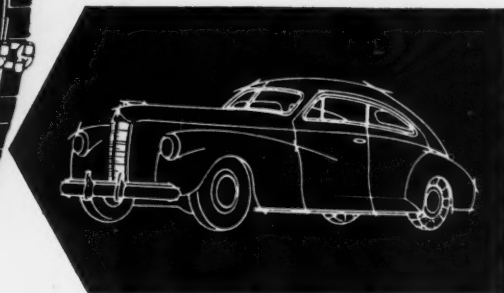
For the past four years Mr. Bluth has served as general chief inspector of all Willys manufacturing operations, including both the military Jeep and the postwar model now on the assembly lines here.

He will be succeeded as chief inspector by Clarence Reynolds.



# McKAY

## Multi-Grip TIRE CHAINS



### *with Double Traction Bars*

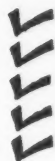
Two traction-bars per link give McKay Multi-Grip Tire Chains *extra* grip and *extra* efficiency which means safe, worry-free winter driving.

Both traction-bars and links are made from the same tough, case-hardened steel. Bars are welded to links at scientifically determined angles which utilize gripping power of both longitudinal and end surfaces. Entire surface of both bars contacts the road. Bars "bite in" all the better as they wear.



*"THE LINK  
DOES IT"*

## McKAY Multi-Grip Advantages



- Two traction-bars per link mean double efficiency.
- "Traction effectiveness" *increases* with wear.
- Double-bar design gives more traction area.
- Side-slip and power-skids are minimized.
- Traction-bars postpone link wear, give extra miles.

### PLUS "EASY-TO-FASTEN" KLIP-LOCK

Exclusive *Klip-Lock* draws chain up tightly, locks securely . . . unfastens with one hand. No jamming . . . no clogging . . . no sticking!



Multi-Grip and Regular Tire Chains are  
DISTRIBUTED THROUGH JOBBERS

**THE MCKAY COMPANY**  
PITTSBURGH, PA. • Sales Office: YORK, PA.

TIRE CHAINS...COMMERCIAL CHAINS...WELDING ELECTRODES



## Normal Stocks of Tires Not Due Until Early 1947 Predicts Rubber Manufacturers' President

Measured against pre-war consumption and even greater post-war requirements, 1946 will continue to be a "famine year" as far as natural rubber is concerned.

President A. L. Viles of the Rubber Manufacturers Association based his appraisal on latest reports from the major rubber producing areas. To it he coupled a warning that most sections of the world market will suffer acute shortages of finished rub-

ber products for many months to come—probably into 1947.

"The picture is much brighter in this country," he said, "both as to raw materials and the finished products. Thanks to the availability in good supply of high quality synthetic rubbers, American manufacturers will reduce substantially the backlog of consumer demand that accumulated during the war years.

"Trade circles expect an all time,

peacetime record consumption of approximately 900,000 tons of rubber in this country in 1946. In light of difficult production problems in the troubled Far East, natural rubber producers may be unable to meet more than a third of this demand. Best current estimates are that natural rubber receipts in this country will run between 250,000 and 350,000 tons.

"Relatively low-cost, petroleum-base synthetic rubber plants with a proven capacity of between 500 and 600 thousand tons of GRS are currently operating. To this can be added estimated output of 70,000 tons of GRI, butyl, and 30,000 tons of GRM, neoprene.

"Indications are thus that basic raw materials requirements of American manufacturers will be met—even though these demands rocket nearly 50 per cent above the 653,000 tons of rubber used in the last full peacetime year, 1940," Mr. Viles said.

"It must be noted, however, that the rubber manufacturing industry had converted successfully to use of 88 per cent synthetic rubber by the war's end. That they were able to do this and still meet exacting military specifications on virtually all types of rubber products is a measure of the great progress in the field of synthetic rubbers since 1941," Mr. Viles asserted.

War requirements have diminished to the extent that the Civilian Production Administration estimates that expected natural rubber receipts may permit an average conversion of up to 70 per cent synthetic rubber and 30 per cent natural rubber sometime in 1946.

"Such a balance of rubber stocks will assure the consumers of this country ample supplies of most rubber goods by the latter part of the year, although fully normal stocks of tires may be as far away as early 1947.

## International Parts Corp. Announces Canada Branch

N. H. Sherman, president of International Parts Corp., Chicago, Ill., announces the formation of International Parts (Canada), Ltd., under the management of M. W. Gasner, vice president.

The Canadian company is located at 71 Front Street East in Toronto and occupies a modern, fire-proof four-story building.

The Canadian policy of merchandising will be exactly the same as International Parts Corp., Chicago. They have already begun operations with a complete line of automotive replacement parts for the Canadian trade.

Mr. Gasner was formerly associated with Canadian Motor Products, Ltd.



Differentials, transmissions and steering gears suffer costly abuse in winter weather when lubricants congeal. MARVEL Mystery Oil added to all gearing keeps greases fluid and maintains a protective film coating even in severest cold. That's because MARVEL Mystery Oil by itself pours freely at 70° below zero—100° below freezing!

Added to crankcase oil, MARVEL Mystery Oil promises instant starting and smoothest running for even sub-zero motors. What's more, this sensational reinforcing additive toughens film coatings to hang on at extreme high temperatures—vital lubrication of oft-neglected upper cylinder parts is assured.

Added to gasoline, the solvent action of MARVEL Mystery Oil goes to work on gums and carbon deposits, and frees sticky valves!

Why not reduce winter wear and worry for your customers—suggest MARVEL Mystery Oil today, for—

Crankcase .....To provide instant starting and smooth out engine performance.

Gas Tank .....To keep fuel system clean—gum and corrosion free.

Differential .....To eliminate clash and strain.

Transmission .....To ease shifting.

Steering .....To loosen stiffness.

EMEROL MANUFACTURING CO., Inc., 242 W. 69th St., New York 23, N. Y.



# MARVEL MYSTERY OIL



Best Tip for Post War!



Make Tire and Vehicle Conservation  
Your **BIG BUSINESS!**

**MEET DIXON** who shows the way with sales of  
**\$60,000 PER YEAR**

Six years ago Dixon invested just \$1,500 in Bear Equipment!

Today, in San Bernardino, California, a small city of 45,000 population and no industries, his sales are now \$60,000 per year. Purchases of Bear Wheel Balancing Weights from his Bear Jobber alone average over \$200 per month!

Today, his all-Bear equipped shop contains 3 Frame Straighteners, 1 passenger car and 1 truck Front End Services, 2 passenger car and 1 truck Dy-Namic Wheel Balancers, 1 truck and 1 passenger Drive Over Alinement Gauges, 1 Welder, 1 Wheel and Hub Straightener, 1 Housing Straightener... all paid for many times over out of profits!



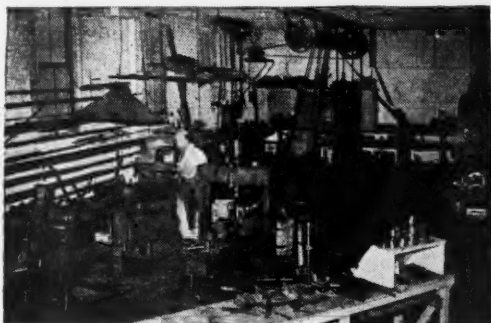
Dixon's Bear Wheel Aliners and Frame Straighteners are installed on sub-level floor.



Shop records of Wheel Balancing Department show average of 810 wheels balanced per month.



Note position of Bear Wheel Alinement Gauges at rear of Bear Machines.



Dixon's Machine and Blacksmith Shop.



Heavy-Duty Bear Balancer is located in the Truck Service Department.



Dixon has the proper Bear Heavy-Duty equipment to handle the big jobs!

**What Dixon is Doing  
YOU CAN DO!**

**YOU HAVEN'T SEEN ANYTHING YET!**

During the war people turned to vehicle conservation through Bear Wheel Alinement and Balancing, and Frame Straightening, THAT VEHICLE CARE NOW BECOMES AS NATURAL AND HABITUAL AS CHECKING GAS, OIL and WATER! This means that the big days are ahead for the men who see the light, and align themselves with Bear!



HEART of Tire and Vehicle Conservation is

**BEAR**

WHEEL ALINEMENT AND DY-NAMIC BALANCING  
FRAME AND AXLE STRAIGHTENING

**DON'T PUT IT OFF! MAIL  
COUPON TODAY FOR THE FREE  
"DIXON" BOOKLET**



**BEAR MANUFACTURING CO.**  
Dept. MA, Rock Island, Ill.

Please send without cost or obligation a copy of the "DIXON" booklet giving details of Dixon's operations which bring him an annual \$60,000 sales volume. Also bulletin on Bear Equipment and name of my nearest Bear distributor.

NAME.....

FIRM.....

ADDRESS.....

CITY.....STATE.....





## Her Gown

custom-fashioned  
by Bergdorf-Goodman

## The Motor Oil

for her car—  
custom-made by Valvoline

To control its quality, Valvoline is refined in limited quantity from pure Pennsylvania crude oil. Every quart costs us more to make—costs you less to use. Naturally, Valvoline is not on sale everywhere, but you will find it at better dealers coast-to-coast. Sold always with this unconditional guarantee: The performance of Valvoline must completely satisfy you—or your money back!



# VALVOLINE

## The Original Pennsylvania Motor Oil

Valvoline Oil Co.—Cincinnati, New York, Washington, Pittsburgh, Detroit, Chicago  
Atlanta, Seattle, Portland, San Francisco, Los Angeles, Toronto, Vancouver

## Mass Production of Butyl Tubes to Start

The United States Rubber Co. will be in mass production of butyl inner tubes early in 1946, it was announced by W. D. Baldwin, sales manager of the U. S. Tires division. During the war their manufacture had been solely for military use, he said, and at present they are being made for civilians in truck and certain of the larger passenger car sizes.

In comparative tests recently conducted by the U. S. Tires division, two identical tires were mounted on a car and inflated to the same air pressures, one tire mounted with a butyl tube and the other with a natural rubber tube. Both were punctured with 3/16" nails which were allowed to remain in the tires, and the tires then run on the car for 91 miles.

At the conclusion of the run, the tire containing the butyl tube still had 25 pounds of air pressure, while the tire with the natural rubber tube was flat. Furthermore, after standing overnight under the weight of the car, the butyl tube still had 10 pounds of air the next morning.

"While butyl cannot be considered as a puncture-proof material, these tests reveal that butyl has a much higher tear-resistance and air retention ability than natural rubber," said Mr. Baldwin. "In this instance, the butyl tube disclosed a tendency to cling tightly around the imbedded nail, thus permitting only a gradual seepage of air from the puncture."

## Packard Presents Awards To Employees for Service

Packard Motor Car Co. recently honored, at annual "graduation" ceremonies, the largest group of employees in the company's history to complete 10 years of service.

Seven-hundred fifty-six employees, including Packard president Geo. T. Christopher and vice president and general sales manager L. W. Slack, were recognized for completing a decade of service at the 28th consecutive presentation. Certificate awards were presented the honored employees by Alvan Macauley, chairman of the board.

Workers from the shop and office were greeted and presented to the Packard chairman by president Christopher who fell in at the end of the line and was 756th to receive his award.

## Assistant Director

Shelton R. Houx has been appointed assistant director of advertising of Nash Motors, it was announced recently by N. F. Lawler, advertising director. For the last two years, Mr. Houx has been an account executive at N. W. Ayer & Son, Inc., advertising agency.



An illustration showing three vehicles: a car at the top, a truck in the middle, and a bus at the bottom, all angled towards the right. The text 'IN CARS' is written in a bold, sans-serif font, slanted upwards to the right, positioned to the left of the car.

**IN CARS**

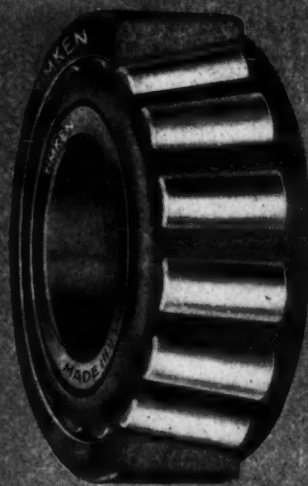
**AND TRUCKS**

**AND BUSES**

Soon new models will be rolling off the assembly lines. Blazing with color and brilliant trim none will lack eye appeal. Important as is outward appearance, it is **PERFORMANCE** that counts.

In most of the cars and trucks and busses you will find Timken Tapered Roller Bearings. Hidden away in wheels, pinions, differentials and steering parts most of them will never be seen, yet they will perform faultlessly.

Manufacturers selected Timken Bearings because no other tapered bearing has performed so well so long. To make sure of getting Timken Bearing benefits in your equipment see that the trade-mark "TIMKEN" is stamped on every bearing you use. The Timken Roller Bearing Company, Canton 6, Ohio.



**TIMKEN**  
TRADE-MARK REG. U. S. PAT. OFF.  
**TAPERED ROLLER BEARINGS**

Have You  
Thought About  
New Sign  
Stands...?



Fig. 1343  
Patd. & Pats. Pend.

...so have we!

Like you, we realize that nothing gets more attention—and quicker buyer response—than a sign in an attractive stand. And the "Hallowell" Sign Stands of Steel are not only good-looking, and sturdily built, but can also be easily assembled.

The stand shown above—only one of many styles from which to choose—is of hollow construction. The top is hinged, and by swinging it to one side, the sign sheet can be quickly inserted or removed. Mail the coupon below for our booklet and price list of "Hallowell" Sign Stands—you're sure to find the right one for your needs!

**Standard Pressed Steel Co.**  
Jenkintown, Penna., Box 561

**Clip this coupon —  
Mail it today —  
For Free Booklet  
and prices!**

Standard Pressed Steel Co.  
Jenkintown, Pa.

Gentlemen:  
Please send me your free booklet  
and price list of "Hallowell" Sign  
Stands of Steel.

Name .....

Street .....

City..... State.....

## Jap Damage to U. S. Rubber Company Plantation Heavy

Destruction of 1,800,000 trees, loss of the major portion of mechanical equipment, and dispersal of half of the native labor population on the Far Eastern plantations of the U. S. Rubber Co. were announced recently by John W. Bicknell, managing director of the plantations, following receipt of first eye witness reports from Malaya and Sumatra.

The announcement was based on written reports from company employees recently released from enemy prison camps in the Far East and on a report submitted in person by W. E. Cake, head of the company's scientific research on the plantations, who has just arrived in this country. Following release from a Jap prison camp where he had been held since 1942, Mr. Cake was able to observe some of the plantation areas before leaving for the United States.

"Reports indicate that 18,000 acres, containing 1,800,000 trees, have been lost, due chiefly to neglect of upkeep and to the Japanese actions in cutting down trees in certain areas for the planting of food crops," Mr. Bicknell said.

"Destruction of 1,800,000 trees, of which 1,500,000 were on Sumatra and 30,000 on Malaya, means a loss of one out of every five and a half trees standing before the war, for we had a total of 10 million rubber trees on the plantations which, incidentally, were the largest in the world under the ownership of one company.

"Loss of equipment has been heavy. We face the replacement of the major portion of our mechanical equipment. Although reports state that the central factory in Sumatra appears to be in good operating condition, on some of the outlying estates all machinery, motors, tanks, piping, and valves have been removed. Fifty miles of the narrow gauge railroad track, out of a previous total of 100 miles, have also been removed."

Because of political disturbance in the Far East, a survey party which the company organized and which was originally scheduled to leave the United States in October has been delayed until clearance is given by the Army. It is now impossible to predict when the situation will settle sufficiently to allow private enterprise to enter the Indies.

## Lempco Distribution Plans

Dorothy Kimmel, managing director of Lempco International, Inc., Cleveland, O., announces that the Tripp Wheel, Hub and Drum Straightening Equipment, manufactured by Wheel Service Equipment Corp. of Detroit, Michigan, will be distributed to all countries, except Canada, by their 57 representatives.

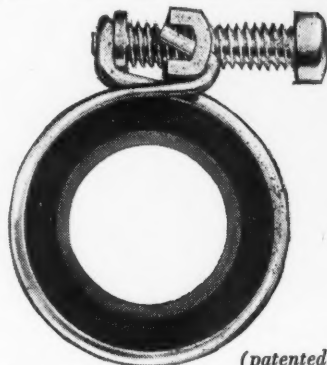
Ripley take  
note...



... believe it or not ... here's a wire hose clamp that tells Mr. Hose ... "You can't leak any more, any more." It encircles the hose with a steel-vise grip at every point of its 360° circumference, and NEVER lets go!

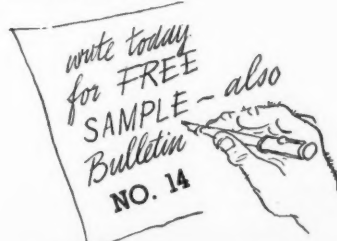


Manufacturers, Mechanics, Owners ... take notice. The Central "360" Wire Hose Clamp is sold with an unconditional guarantee that it will do its job — no "clinchers" barred!



(patented)

P.S. No shock, jolt or vibration can lessen or loosen the powerful grip of the "360" clamp. Costs no more ... but worth much more.



**CENTRAL "360"**  
**WIRE HOSE CLAMP**  
**CENTRAL EQUIPMENT CO.**  
900 S. WABASH AVENUE, CHICAGO 6, ILL.





## Alternating Pressure Action

### A Card Deck Helps Explain It!

Ever tried to pull a card from a deck lightly held like this one? Try it and you'll have a good illustration of the resistance to movement that is set up by the overlapping leaves of Spiro-Seal... a resistance that helps cause a lag in expansion and contraction as the piston moves up and down in the cylinder. Result: higher unit pressure on down-stroke for maximum oil and blowby control; lower unit pressure on up-stroke for finest wall lubrication.

A

## NO END to Success when you use THE RING WITHOUT END

You want a ring that you can be sure will stop oil pumping and excessive blowby in tapered... out-of-round and rebored cylinders. One ring combination will do it... 10-Up. There's nothing like RAMCO 10-Up because 10-Up patented features include Spiro-Seal... the steel ring without end... the ring that makes possible correct wall pressures *automatically adjusted to cylinder conditions*. Ramsey Accessories Mfg. Corp., 3718 Forest Park Blvd., St. Louis, Mo. Factories: St. Louis, Fruitport, Toronto.

DO THE JOB RIGHT...

Re-power every job with  
all-purpose Piston Rings

WITH THE 10,000 MILE RING AND LABOR WARRANTY

Copyright 1945 by  
Ramsey Accessories Mfg. Corp.





Yes, we're back on the job . . . once again filling the needs of the people who insist on sure, dependable USALITE Flashlights and Batteries.

Very much in evidence in the USALITE line is the experience of many years in quality flashlight and battery manufacture . . . plus the added knowledge gained in supplying huge quantities of USALITE Flashlights and Batteries to our Armed Forces.

There's profit, there's customer satisfaction in selling USALITE Flashlights and Batteries. Order from your jobber today.



## Flashlights & Batteries

"A" & "B" Batteries for Portable Radios

UNITED STATES ELECTRIC MFG. CORP. Factory and Exec. Off.: New York 11, N.Y. Branch Off.: Chicago 7, Ill.

### Colbert Advanced to President of Dodge Div.

K. T. Keller, President of Chrysler Corp., announced recently that L. L. Colbert, had been made president of the company's Dodge division.

Colbert will replace H. L. Weckler, who in addition to his position as vice president and general manager of the corporation, has been president of the Dodge division since 1943. Mr. Weckler will now be able to devote all his time to his many responsibilities and duties in connection with the parent company.

Colbert has been with Chrysler Corp. for twelve years, ten of which he was a vice president of Dodge, and recently, in addition, was general manager of the company's Dodge Chicago Plant where, under his direction, more than 18,000 Wright B-29 engines were turned out.

### Van Horne Named District Manager by Blackhawk

H. F. Van Horne has been named a district manager by Blackhawk Mfg. Co., to succeed Fred M. Pierce. The sales district includes Minn., Wis., Ia., the Dakotas, Neb., Upper Mich., and Northeast Ill.

Fred M. Pierce died on Nov. 5, 1945, following a year-long effort to recover from a heart ailment. He was widely known in equipment distribution circles and had been with Blackhawk since June, 1930.

Van Horne, who headquarters in Minneapolis, has 14 years of experience in the territory he will now manage.

### Ford Hiring More Than 300 Workers a Day

Daily employment of more than 300 persons at the Ford Motor Co. is expected to continue until normal production is reached in 1946, J. S. Bugas, director of industrial relations, announced.

Ford's low point in employment was on Sept. 15, when Rouge plant workers totaled 63,870. Rouge wartime peak employment was 100,172. However, since September, the number of Rouge workers has increased steadily. Today workers at the Rouge total 71,040.

Soon after the first of the year Ford plants will have absorbed the majority of eligible and available workers laid off through cancellation of war contracts.

In view of Ford's program, with \$175,000,000 to be spent in post-war expansion, the number of workers employed in company plants throughout the nation should reach the pre-war level in the next few months, provided there are no further production stoppages and the suppliers' situations are remedied.

Advertisement

## NEW TRUCK, BUS & TRACTOR ENGINE OVERHAUL STAND

... Mobile — Safe — Time and Labor Saving

This new Clayborne AC-15 Engine Overhaul Stand for automotive, bus, truck and tractor engines to approx. 1500 lbs. weight, handles complete engine, including oil pan, bell housing and accessories. It also positions transmissions and rear axle assemblies.

The Universal Heavy-duty Stand is built to give you production line efficiency—to save hours of labor time—to produce better workmanship—to lower your costs substantially—and to make you more money.



With this Stand you can rotate the engine through full 360° by fully enclosed, safe and positive worm drive mechanism operated by crank. An index plunger is provided to lock in various positions if desired. Every engine part is readily accessible.

Slotted mounting brackets are adjustable to pan rail widths. The unique use of interlocking triangles insures great rigidity. Side rails are of heavy square tubular construction and fittings. Fittings are carbon steel castings, about one third stronger than malleable, and Stand is heavy carbon steel tubing, equipped with 6-inch heavy duty casters and sturdy floor lock. Model AC-15 carries International Harvester Co. number SE-1434. Shipping weight approx. 445 lbs.

Completely illustrated and descriptive folders are available on the new Model AC-15 Universal Heavy-duty Stand, as well as for the Universal Model 201 for all engines other than V-type up to 600 lbs.; also Ford V-8, Chevrolet and Dodge-Plymouth short block assembly Stands. A complete line of Aircraft Engine Stands is also available. Address inquiry to: Clayborne Manufacturing Company, Dept. "M", 209 South LaSalle Street, Chicago 4, Illinois.



One of the most reliable parts of an engine is the AC Fuel Pump, heart of the fuel system. That's because it's *first quality* in design, material, and manufacture,—built to meet the engine maker's own requirements.

Serve your customers best, and protect your own reputation, by replacing worn pumps with new or factory-rebuilt AC's, and making repairs with authentic AC Parts Kits or Diaphragm Kits.

#### QUALITY FEATURES

- ★ Careful control of pressure and flow assuring correct fuel supply.
- ★ Accurate hardening, precision machining of parts essential to long life.
- ★ Accurate control of spring tensions and temper.
- ★ High, and controlled, pin hardness.
- ★ 4-layer, patented-impregnation diaphragms of special airplane cloth.
- ★ Carefully finished rocker arm pads, located to center on cam.
- ★ Split-hair rocker arm clearance and control of pad hardness.
- ★ Uniform pull rod hardness at pin holes.

# AC FUEL PUMPS

#### SEND FOR AN AC PUMP SHOP MANUAL

Field Service Department, AC Spark Plug Division, G. M. Corp.  
910 Mott Foundation Building, Flint 3, Michigan

Gentlemen: Please send at once, no charge, the AC Shop Manuals checked:

- |  |  |
|--|--|
| <input type="checkbox"/> How to Service Spark Plugs                    | <input type="checkbox"/> HOW TO SERVICE FUEL PUMPS   |
| <input type="checkbox"/> How to Service Spark Plug Cleaner             | <input type="checkbox"/> How to Service Air Cleaners |
| <input type="checkbox"/> How to Service Oil Filters                    | <input type="checkbox"/> How to Service Speedometers |
| <input type="checkbox"/> How to Service Ammeters and other Instruments | <b>MA-1</b>  |

NAME \_\_\_\_\_  
FIRM \_\_\_\_\_  
STREET ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_

# 10 QUICK FACTS ON FINANCING

(Past...Present...and Future)

*Learn how you can make up to \$10,000.<sup>00</sup>  
MORE profit in the next 12 months*

**1** **AT THE END** of 1941, Banks had outstanding auto receivables in the amount of \$721,000,000 (source—Federal Reserve Bank Bulletin).

**2** **THIS MEANS** that Banks' volume for the year 1941 was twice the outstandings—or \$1,442,000,000.

**3** **U. S. CENSUS** of Business Statistics (Department of Commerce figures reported by Market Data Book) show that in 1939 there were a total of 31,511 new car dealers. And that year their combined volume was \$4,292,716,000.

**4** **HOWEVER**, only 3,818 dealers (12% of all U. S. new car dealers) located in 93 cities of 100,000 population and up, did 38½% of the total U. S. volume.

**5** **BY PROJECTING** 38½% into the total bank volume we find that

in these major cities the bank volume was at least \$555,170,000.

**6** **RESERVES** on this minimum major-city bank volume, computed on the lowest basis, amount to \$19,430,950. This is the minimum amount of income major-city dealers **LOST** as a result of Bank competition in 1941!

**7** **DIVIDING** that lost reserve figure (\$19,430,950) by the number of major-city dealers (3,818) gives \$5,088 per dealer. **THIS IS THE AMOUNT OF RESERVE THE AVERAGE METROPOLITAN AREA DEALER LOST AS A RESULT OF BANK COMPETITION IN 1941.**

**8** **IMPORTANT** as this amount of profit is to any dealer, it probably is lower than his real loss, because in 1941 only a few thousand banks were financing autos and it is probable that

far more than 38½% of their volume was concentrated in these 93 major markets. Thus, if there is any element of error in the indicated loss-of-reserve figure per average major-market dealer, it is probable that the figure is too low.

**9** **TODAY**, there are 10,000 banks actively seeking these loans and in addition 75,000 insurance men will be helping them get the business.

The future average loss of reserve per metropolitan area dealer thus can easily exceed \$7,500 ... or even \$10,000!

**10** **GENERAL FINANCE** Corporation will soon announce a *new* plan that will effectively help you to regain this business—putting thousands of dollars of *lost reserve back* in your pocket. Phone, write or wire General Finance headquarters in Chicago for confidential advance details.

## General Finance Corporation

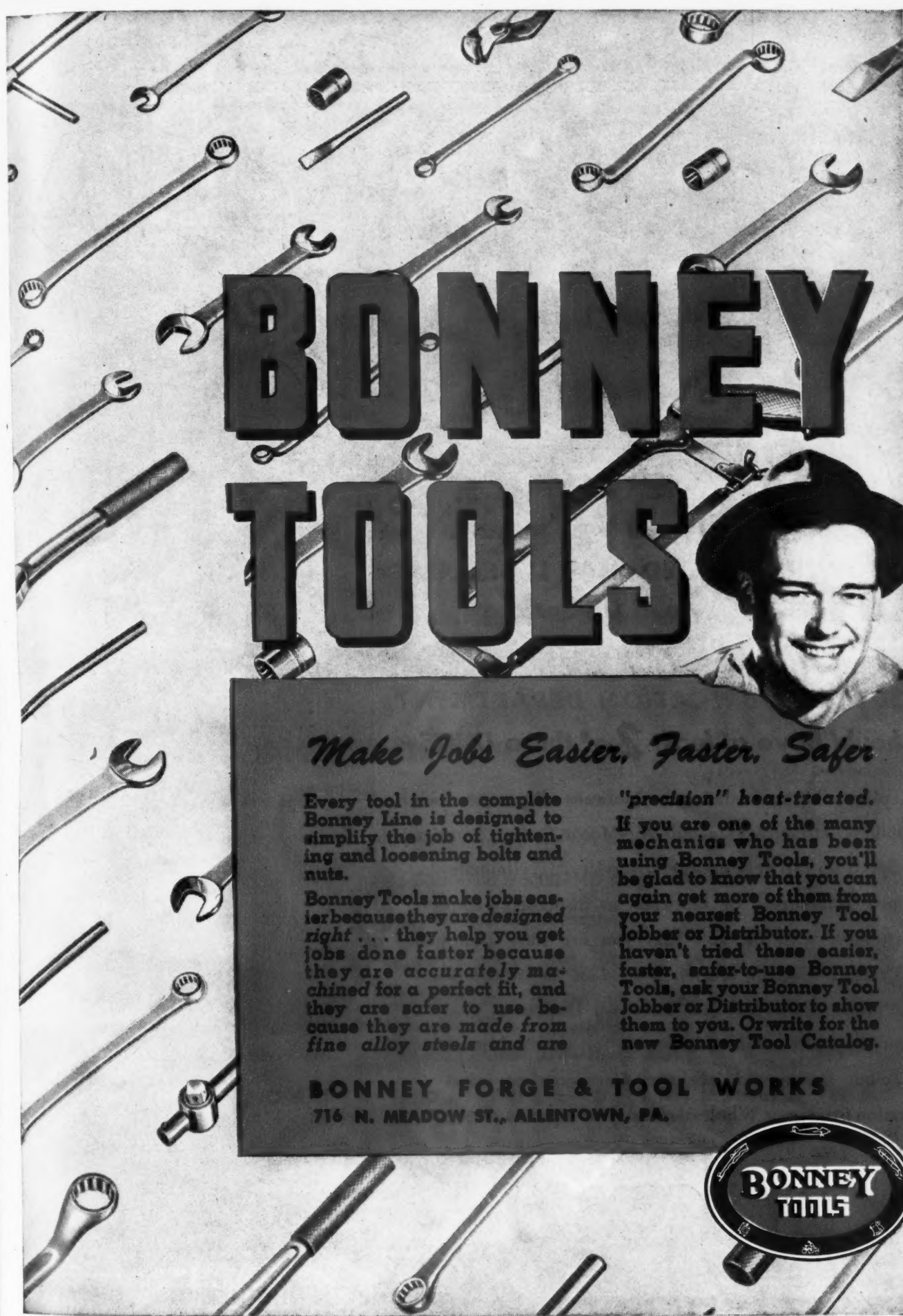
BRANCH OFFICES IN



PRINCIPAL CITIES

184 West Lake Street • Chicago 1





# BONNEY TOOLS



*Make Jobs Easier, Faster, Safer*

Every tool in the complete Bonney Line is designed to simplify the job of tightening and loosening bolts and nuts.

Bonney Tools make jobs easier because they are designed right . . . they help you get jobs done faster because they are accurately machined for a perfect fit, and they are safer to use because they are made from fine alloy steels and are

"precision" heat-treated.

If you are one of the many mechanics who has been using Bonney Tools, you'll be glad to know that you can again get more of them from your nearest Bonney Tool Jobber or Distributor. If you haven't tried these easier, faster, safer-to-use Bonney Tools, ask your Bonney Tool Jobber or Distributor to show them to you. Or write for the new Bonney Tool Catalog.

**BONNEY FORGE & TOOL WORKS**  
716 N. MEADOW ST., ALLENTOWN, PA.





# LINCOLN

**POWER OPERATED GEAR LUBRICANT  
DISPENSERS Speed Up Service**

**--- Increase PROFITS...**

*Every* **LUBRICATION DEPARTMENT  
should have at least 2 of these UNITS-**

Replace old, outmoded gear lubricant dispensers with modern, attractive Lincoln Air-Motor-Operated units. -Speed up this very important service, . . . eliminate the messy transferring of lubricant to dispensers - Impress customers with the fact that you are fully equipped to render efficient service. Two Lincoln Model 4408 Air-Motor-Operated Gear Lubricant Dispensers give you the right combination - one for gear lubricant . . . one for hypoid lubricant. Get complete information from your Wholesaler today or write us direct.

**"IT'S THE FINEST THAT MONEY CAN BUY"**

# LINCOLN

A1522

*Pioneer Builders of Engineered Lubricating Equipment*

**MODEL 4408 PORTABLE GEAR LUBRICANT DISPENSER . . .** Equipped with the famous Air-Motor-Operated Lincoln Lubrigun. Dispenses direct from original 100-lb. refinery drum housed in the cabinet. Has a positive displacement meter that registers accurately the quantity of lubricant dispensed. An air-expellor in the pump prevents pumping of air through the meter. Smooth operating, swivel-type rollers give it easy portability. Furnished with name plates to identify type of service.

**LINCOLN ENGINEERING COMPANY**  
5701 NATURAL BRIDGE AVE., ST. LOUIS 20, MO., U. S. A.



# It's here... It's automatic



## THE RESISTOFLEX VULMASTER

REPAIRS TIRES, TUBES AND VALVE STEMS BY THE WORLD-FAMOUS STENOR PATCH PROCESS

### IT'S DIFFERENT!

1. Vulcanizes sidewall surface cracks on the wheel.
2. It's fully automatic—works for you while you work elsewhere.
3. Direct electric heat. No pads—no moulds—no sandbags.
4. The skill to do the job is built into the Vulmaster.
5. Equally efficient with synthetic and natural rubber.
6. One hundred thousand Vulmasters in use throughout the world — now made in the United States by Resistoflex.

See Vulmaster at the M.E.M.A. Conference, Stevens Hotel, Chicago



ASK YOUR JOBBER FOR FULL DETAILS OR WRITE

# RESISTOFLEX

Trade-Mark Reg. in U. S. & Can. Pat. Off.

**Resistoflex Corporation**



**Belleville 9, New Jersey**

JANUARY, 1946

When writing to advertisers please mention Motor Age

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# DURO-CHROME

## *...a Doggone Good Tool!*



***There is No Substitute for Good  
Tools — and Duro-Chromes  
are “Doggone Good”!***

DURO hand tools are so beautifully balanced that they feel like an extension of one's own arm. When a mechanic picks up such a tool, he knows that tool is RIGHT, and the way the tool performs confirms his opinion. That's how DURO tools bring *OUT* the skill and experience that are *IN* a man; the mechanic enjoys using them, and the boss appreciates the better work that's done. That is why—across the nation and around the world, in every language—both men and management agree that “DURO Tools are Doggone Good Tools” . . . Duro Metal Products Co., 2649 No. Kildare Ave., Chicago 39, Illinois.

**DURO TOOLS** (HAND TOOL DIVISION)



*The Mechanic's Best Friend*  
OVER A BILLION BUILT SINCE 1916

ALSO MAKERS OF DURO MACHINE TOOLS





THERE ARE *Three* VOLTMETERS  
ON THE  
FOX FAST BATTERY CHARGER

Three direct-reading, *waterproof* voltmeters — built to FOX specifications — show at a glance the condition of each individual battery cell. And matched resistances assure maximum accuracy of each reading.

But this is only one of the many features which make the FOX Fast Battery Charger "The Charger of Tomorrow", available today. *Write now for full information!*

**FOX**  
PRODUCTS COMPANY  
PHILADELPHIA 41, PA.



# ARE YOU PREPARED

*to handle*  
**Trade-Ins**  
**ON**  
**TIRES?**

## » BOWES CHECK-N-SPECT Makes Repairs Easy

Literally turns tires inside out . . . opens 'em up so you can inspect thoroughly at a glance . . . gives you space to make **INSIDE** repairs easily and quickly. No spot on the tire is hard to reach—or see—when you have Bowes Check-N-Spect.



## » BOWES LECTROSEAL Vulcanizes Casing Breaks

Operates electrically—without cumbersome molds. Automatic thermostat control insures uniform heat and satisfactory results. Plugs into any standard electric socket, no additional wiring needed. Fits on your workbench.

● Just as soon as tires become more plentiful, your competition will offer discounts on trade-ins. And customers will go right back to pre-war thinking . . . "Where can I make the best deal?". If your competitor offers a better trade-in than you do, **YOU WON'T GET THE BUSINESS.**

Selling new tires is going to be mighty tough on the fellow who must meet the discount, but can't get his money out of the old tires. He will never get it back from the junk man.

## **BOWES EQUIPMENT and TRAINING** **Enable You to CASH IN on Trade-Ins**

Bowes equipment gives you **EVERYTHING** you need to recondition old tires so that you can re-sell them at a profit. This equipment is inexpensive; you can easily afford it. It requires no extra space. Bowes training by factory experts will enable you to do the best tire repair job in the business.

New tires will be plentiful sometime . . . that's certain. Better get equipped **NOW** to handle trade-in business like the other fellow does if you want to sell tires . . . at a **PROFIT.**

**WRITE US TODAY** and a Bowes distributor will call and give you the whole story without obligating you in any way.

# BOWES



# TIRE SAVING SYSTEM

BOWES "SEAL FAST" CORPORATION, INDIANAPOLIS 7, INDIANA



# U.S. Again sets the pace

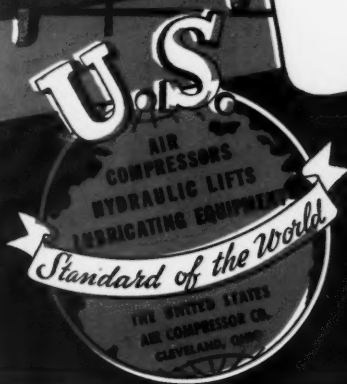
U.S. is starting in where they left off at the declaration of war, leaders in the field of quality built air compressors for the automotive trade. That leadership was attained on performance, absolute dependability and long trouble free life over a period of many years. To-day we still pace the field because we can boast of over a quarter of a century's experience creating, designing and manufacturing air compressors for the automotive trade, a well seasoned progressive engineering department working on to-morrow's problems to-day, manufacturing facilities second to none, and a well rounded out sales, and service organization that are always on the job ready and willing to be of service to you. U.S. manufactures a wide range of Air Compressors for the automotive field. Make no mistake about this—every U.S. Air compressor from the smallest to the largest is a quality product from stem to stern.

**Sound decisions rest on facts and here are some facts on U.S. Air Compressors:**

They combine every feature used on competitive compressors plus many of their own such as: large area cooling fins on cylinder and head—cooler operation—less carbon—Timken Bearings—greater efficiency, longer life—V type belts, quicker starting—totally enclosed centrifugal dirt proof automatic unloader prevents overload—ing of motor—check valve is leakproof and noiseless—all parts are machined to closest tolerances and are carefully inspected.

All U.S. Compressors meet the standard specifications as set by the National Bureau of Standards under United States Dept. of Commerce.

*Send for the free catalog on U.S. Compressors*



**THE U.S. AIR COMPRESSOR CO.**  
5300 HARVARD AVE. CLEVELAND, OHIO

AIR COMPRESSORS  
LUBRICATING EQUIPMENT  
HYDRAULIC LIFTS



## PERFORMANCE as great as the name



**THE NAME EDISON** is associated with the greatest developments in electricity. It is on quality products that most people use every day. It has acceptance. It means easier sales for you.

**EDISON QUALITY** assures performance as great as the name. The Edison "SPUN-ON" Leakproof Gasket, insuring a 100% compression-tight seal between spark plug and engine-block, is typical of engineering research that puts Edison first in the field.

**CONTROLLED DISTRIBUTION** protects you against cut-price competition and safeguards that extra margin of profit.

WRITE FOR PARTICULARS



# Edison

## SPARK PLUGS

EDISON-SPLITDORF CORPORATION, WEST ORANGE, N. J.



### *First Choice*

in parts cleaning equipment is the new Circo "Chief" degreaser because it tops 'em all, in speed, thoroughness and efficiency. It's tops with the mechanic as well as the shop owner and here is why.

Circo "Chief" degreaser will "hot vapor clean" and dry dirty, greasy parts in less than three minutes without cutting in on the mechanic's time. No mechanic worthy of the name wants to be a "grease scrubber" and with a Circo "Chief" degreaser in the shop the mechanic is relieved of this dirty job and free to devote his entire time to the one job that pays dividends — repair work.

Aside from keeping the mechanic on productive work the Circo "Chief" degreaser will clean more parts in less time with less effort and at less cost than any parts cleaning unit on the market.

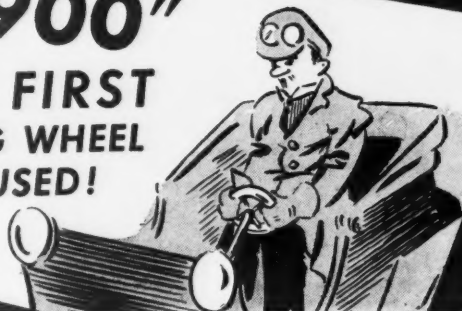
Incorporated in the Circo "Chief" degreaser are five different cleaning methods, hot vapor cleaning (automatic) drying (automatic) spraying (automatic) dipping and soaking.

Regardless of how you are handling your parts cleaning at the present time you cannot sidestep these facts: — if you employ two or more mechanics the Circo "Chief" will increase production, increase mechanics' productive hours, clean parts better, faster and more economically. Send for free Bulletin today.

**CIRCO PRODUCTS CO.**  
2835 CHESTER AVE. • CLEVELAND 14, OHIO

ANOTHER FAMOUS  
FIRST

IN "1900"  
THE FIRST  
STEERING WHEEL  
WAS USED!





*You were wrong*

**THE TIME YOU PUT COLD WATER IN A HOT ENGINE**



*... but you're right* **WITH PACKARD CABLE**

Heat and cold, oil and water, corona and abrasion . . . Packard Four-Forty ignition cable successfully resists them all. That's why you're *right* when you replace worn-out, inefficient spark plug wires with Packard Four-Forty. With its tough protective sheath, it keeps on carrying the

load under the toughest conditions.

Packard Four-Forty has been judged right for replacement by most service stations, dealers and garages. It's the right ignition cable to give top efficiency and build better business for you! No other can match it.



**FOREMOST BUILDER OF AUTOMOTIVE AND AVIATION WIRING**

# TRUSTWORTHY QUALITY



Battery users have learned that they can depend on Willard Batteries for long life and high grade performance. Depending on Willards is safe because every Willard Battery is built to ONE standard of quality—the traditionally high WILLARD standard. When you sell Willards, you sell TRUSTWORTHY quality.



"SAFETY-FILL"  
BATTERIES  
**Willard**

Automobile • Truck & Bus • Radio • Motorcycle • Tractor  
Aircraft • Charge-Retaining • Marine • Diesel • Stationary

**... the power to carry on !**

WILLARD STORAGE BATTERY CO. • CLEVELAND • LOS ANGELES • DALLAS • TORONTO

JANUARY, 1946

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# RAYBESTOS TAKES THE GUESS WORK OUT OF BRAKE WORK



● Raybestos PG Sets give you the right combination of brake linings for every job—perfectly matched and all ready for simple, quick installation. Six different PG Sets service 90% of the passenger cars.

Raybestos Sets are engineered for each car,

and Proving Ground tested to assure top performance. Only Raybestos makes all *seven* types of lining needed to service all cars best.

Reline with Raybestos PG Sets. You'll have more satisfied customers, and bigger profits from your brake work—without guesswork.

THE RAYBESTOS DIVISION of Paybestos-Manhattan, Inc. • Bridgeport, Connecticut



BRAKE LINING, BRAKE BLOCKS,  
CLUTCH FACINGS, FAN BELTS, HOSE  
for Cars, Trucks, Buses and Tractors





**A CORK GASKET** that fits and seals

**Bolt holes always line up . . .** installation is fast and easy . . . when you use Armstrong-Victor Cork Gaskets. That's because shrink and stretch are eliminated by a special binder. This exclusive feature, plus live, resilient cork composition, guarantees an oil-tight seal—even between surfaces that are rough, pitted or somewhat warped.

Armstrong-Victor Cork Gaskets are supplied in handy, clearly labeled packages, for all popular makes of cars, trucks, buses, and tractors.

Ask your jobber for Victor Gasket List No. 32. Or write Victor Manufacturing and Gasket Company, P. O. Box 1333, Chicago 90, Illinois.

**LOOK FOR THE  
TWO-NOTCH  
TRADE-MARK**



**Armstrong-VICTOR**



**CORK GASKETS • CORKOLIN • CORK SHEETS**



# Every Season A SELLING SEASON!

Neither frost nor heat can spoil the pleasure of driving—with a WIT-EEZ AUTO FAN on the job. WIT-EEZ takes the simmer out of summer driving; and in the winter, keeps windshields clear of frost and foginess . . . while circulating warmth throughout car.

Motorists know WIT-EEZ as a year 'round essential to riding safety and comfort . . . know WIT-EEZ as *the* purposeful, efficient auto fan. And concentrated national advertising reminds them of it regularly! Write or wire today for prices and delivery of the all-season selling WIT-EEZ!



Licensed under  
Patent No. 2095223

## FAMED FOR QUALITY

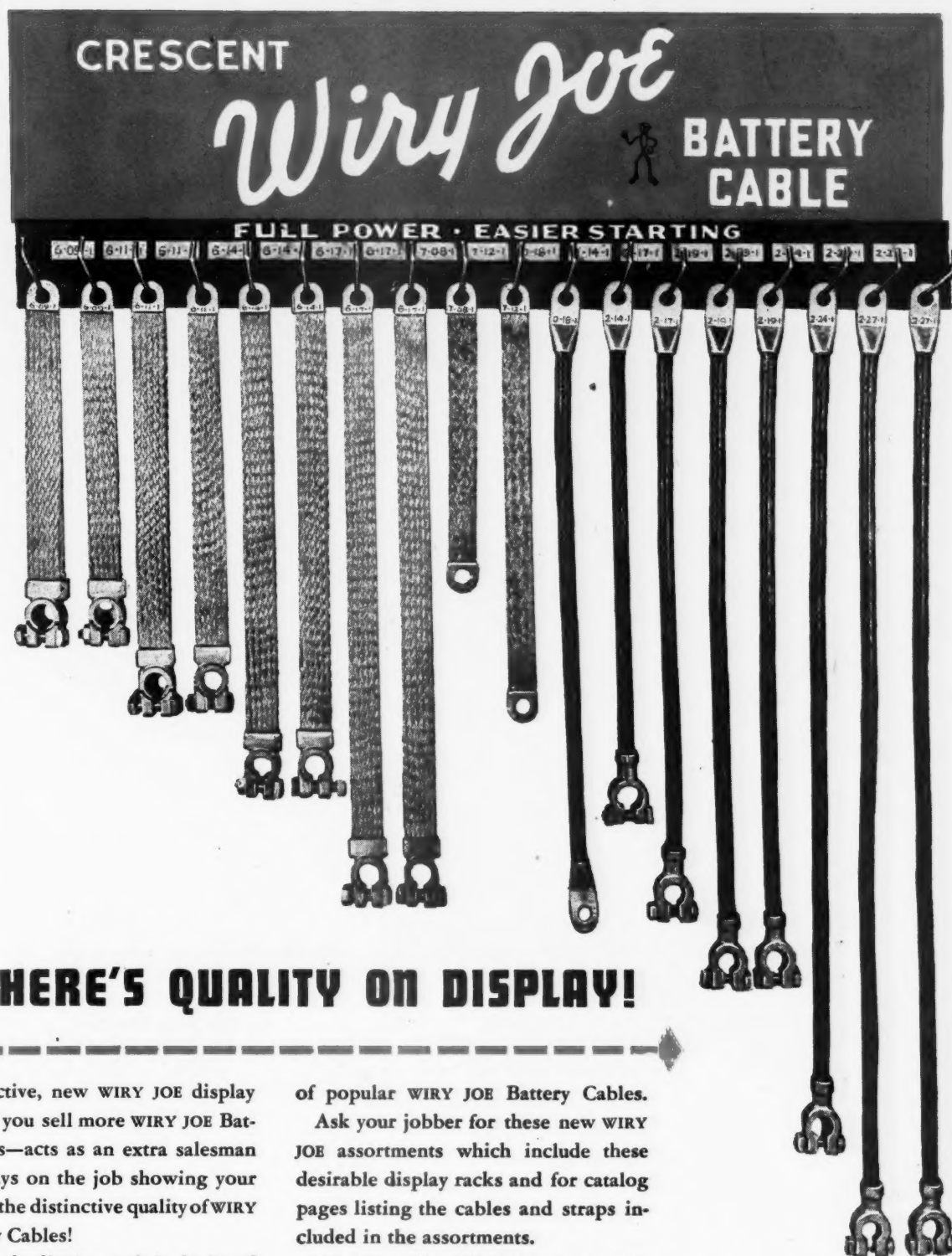
Three six-inch safe rubber blades securely anchored. Specially-developed motor controlled by positive action switch. Minimum battery drain, non-radio interference. Fits all cars, easy to install.



## NATIONALLY ADVERTISED

in Saturday Evening Post,  
Collier's, Liberty, Esquire,  
National Geographic, Trailer  
Topics.

WITTIE MFG. & SALES CO. General Offices and Plant, 1414 S. Wabash Ave., Chicago 5, Ill.  
Branch Offices and Representatives in New York, Kansas City, Los Angeles and Detroit.



## HERE'S QUALITY ON DISPLAY!

This attractive, new WIRY JOE display rack helps you sell more WIRY JOE Battery Cables—acts as an extra salesman that's always on the job showing your customers the distinctive quality of WIRY JOE Battery Cables!

This sturdy display rack is designed to hold a full assortment of the WIRY JOE Battery Cables and Straps needed to service cars and trucks. It comes to you very carefully packed with an assortment

of popular WIRY JOE Battery Cables.

Ask your jobber for these new WIRY JOE assortments which include these desirable display racks and for catalog pages listing the cables and straps included in the assortments.

*And remember this!* When you service a car or truck, *check the battery cable!* Show your customer just why a new WIRY JOE Battery Cable will assure easier starting and better engine performance.

**✓CHECK THE WIRE ON EVERY JOB!**



*Wiry Joe*

**AUTOMOTIVE CABLE**

manufactured by  
**THE CRESCENT COMPANY, Inc.**  
Pawtucket, Rhode Island



# RAISE IT WITH

# TIC

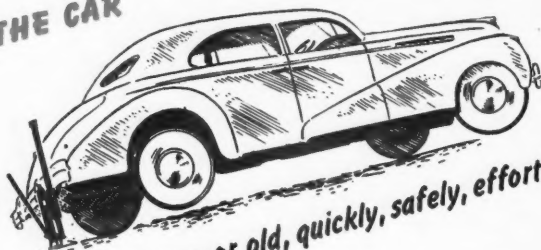
The new

## TIC-o-matic

## Hydraulic Jack

The Finest in Modern Engineering

FOR THE CAR



Lifts any car, new or old, quickly, safely, effortlessly

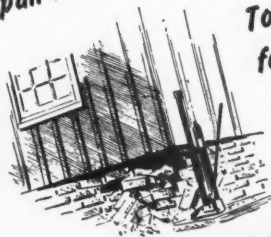
FOR GENERAL UTILITY



To pull rooted stumps



To repair wagon wheels



To lift barn or out-building for foundation repair

There are dozens of jobs for TIC around the place. Wherever anything up to 1½ tons is to be lifted, TIC will do it—and without effort or strain. 24" built-in handle and easy horizontal motion respond easily to even a woman's touch. Won't leak. Guaranteed slip and tip proof. PROMPT SHIPMENT!

Now taking orders for

## TIC-o-electric

Hydraulic Electric Unit. Converts any TIC-O-MATIC Jack to 100% automatic performance in a few minutes. Easy to install. Simple to use—just push a button and up goes your car.

### SPECIFICATIONS

Capacity	1½ tons (tested to 8 tons)
Hydraulic Lift	20"
Max. Act. Lift	31½"
Overall Height	28 1/16"
Hook-low	7"
Hook-high	113½"
Weight	21 lbs.
Overall Hgt. extended	48 1/16"
All Aluminum and Steel	

TIC-O-MATIC  
Series 1900  
Dumper Lift Model  
A complete line  
of TIC Jacks—  
1½ to 20 tons soon



**TUDOR INDUSTRIES CORP.** NEW YORK, N. Y.  
PLANT AND GENERAL OFFICES—SCRANTON, PENNA.  
MAKERS OF HYDRAULIC JACKS OF PRECISE DISTINCTION.

\*Patents Pending

\*Reg. U. S. Pat. Off.



**1  
USE  
THEM!**

For Cold, Non-Vulcanized  
Repairs In Your Own Shop

**2  
SELL  
THEM!**

To Motorists For Emer-  
gency Roadside Use



## 2 ways YOU PROFIT WITH... INLAND EMERGENCY TIRE REPAIR PATCHES!

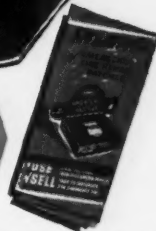
With this new addition to the Inland line of "Profit Makers" you make money 2 ways—by installing them in customers' tires... by selling *extra* patches to motorists for emergency roadside use. Packed in Inland green, yellow and red display cartons, Inland Patches are one of the "hottest" tire repair lines on dealers' shelves today—the only line of Emergency Tire Patches packaged for across-the-counter volume sales. No buckling or curling... cords extend full length of plies... no half-plies... tough, flexible and featheredged...



**Special Assortment \$14.74**

45 Patches • Quart of Emergency Cement  
Can of Talc • Stitcher • Brush

*Free Folder* gives complete  
details on shapes, sizes and prices.  
33 So. Clark St., Dept. MA-1 — Chicago 3, Ill.



**INLAND**

**INLAND RUBBER CORPORATION**

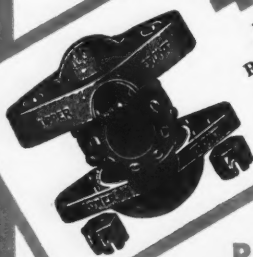
Subsidiary of Minnesota Mining & Manufacturing Company  
Branches in thirteen principal cities

TIRE MANUFACTURERS SINCE 1910



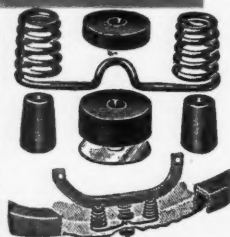
MANY MODEL **A'S** ARE **RUNNING AGAIN!**

**MANY  
NEED THESE**



**42**

Front  
Radius  
Rod Rubbing  
Socket and  
Cap  
LIST  
85c each



**66**

Improved  
front  
Motor  
Support  
LIST  
85c each



**77**

One-piece  
Distributor  
Shaft  
LIST  
75c each

**WE ARE  
READY TO SUPPLY—ORDER FROM YOUR JOBBER.**

**CHAMP-ITEMS Inc.**

6191 MAPLE AVE.  
ST. LOUIS, 14, MO.

*Sight Feed* is more  
than a **TRADE NAME**

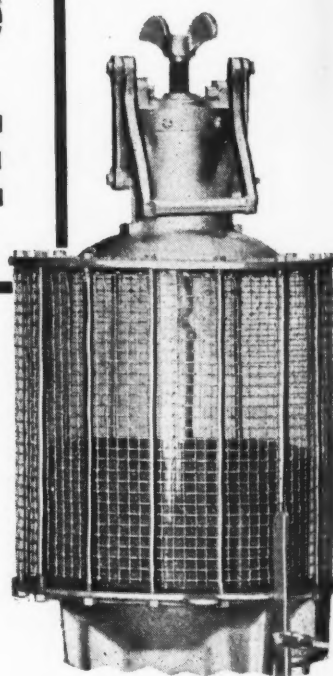
● It's true that "Sight Feed" is the name of one of the finest acetylene generators on today's market. But "Sight Feed" is also descriptive of an outstanding feature of this generator: the completely transparent Pyrex hopper which holds the carbide.

A glance at this hopper before you start a welding job will instantly tell you how much acetylene you may expect from your latest "charge." No guesswork—no "running out of heat" in the middle of a job—and the feed is entirely automatic.

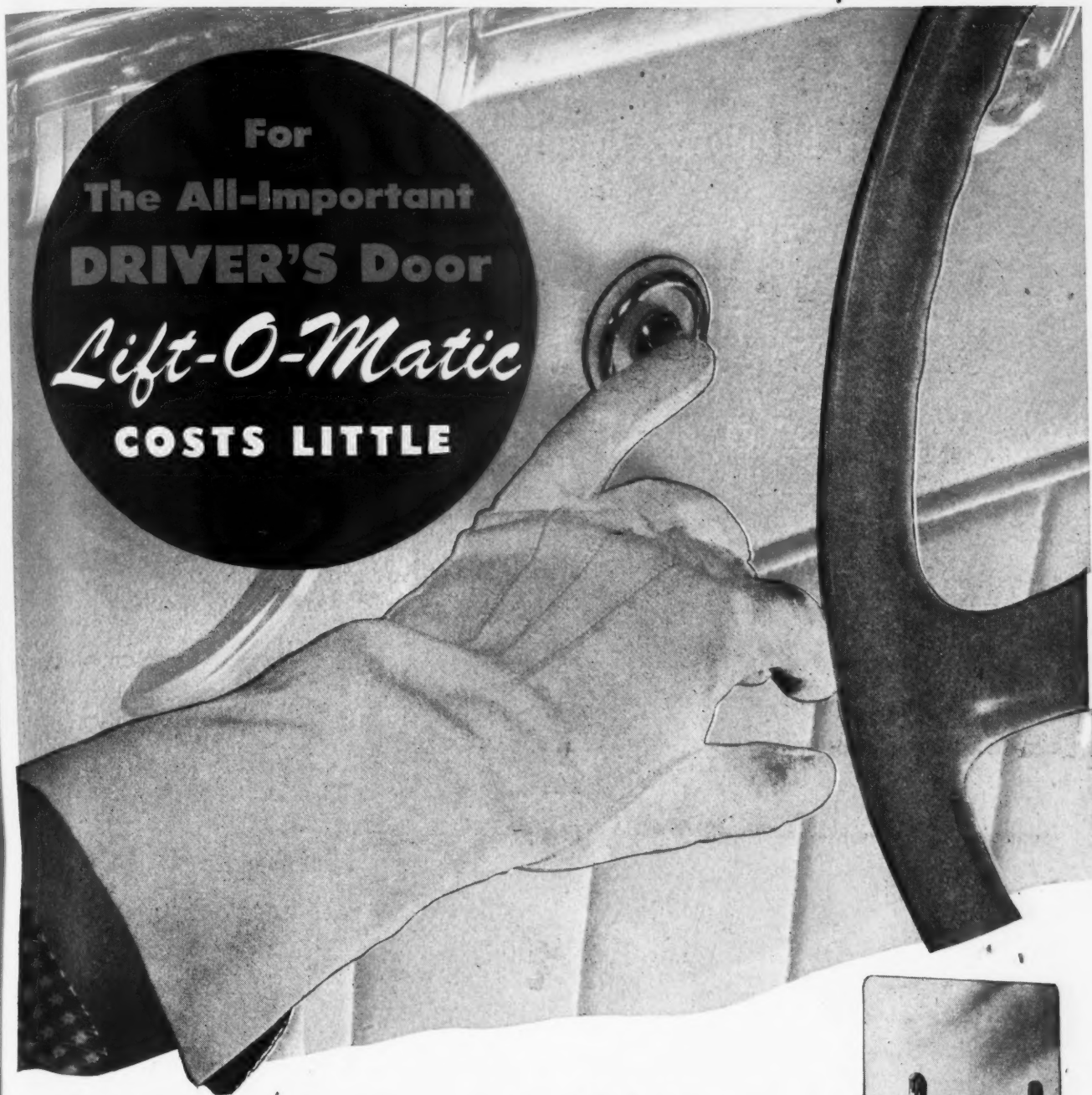
"Sight Feed" acetylene is purer, hotter—yet it costs only a *fraction* of what you pay for "bottled" acetylene. Can you afford *not* to buy a "Sight Feed"?

*Contact your jobber, or...*

**THE SIGHT FEED GENERATOR COMPANY • RICHMOND, INDIANA**







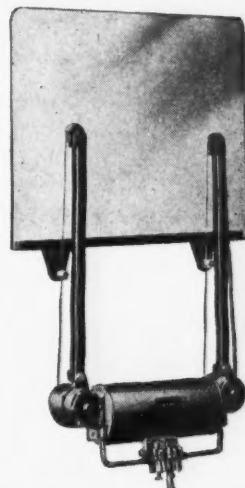
• More than any other in the car, it's the *driver's* window that needs touch-button control.

At nearly one-fourth the cost of an all-window installation, the all-important driver's door can be Lift-O-Matic equipped—for each Lift-O-Matic power unit is complete and self-

contained within the door.

Thus the motorist can be offered, at low cost, a power window control system which meets nearly 100 per cent of his needs—which, at the flick of a finger, flashes the driver's window up or down in a split second. Leaves both hands on the wheel.

*Send for our new booklet which illustrates ALL of the advantages offered by the perfected Lift-O-Matic.*



Dependable, economical, silent—backed by production experience in the manufacture of over 80 million instruments employing harnessed air power, used in motor car transportation all over the world.



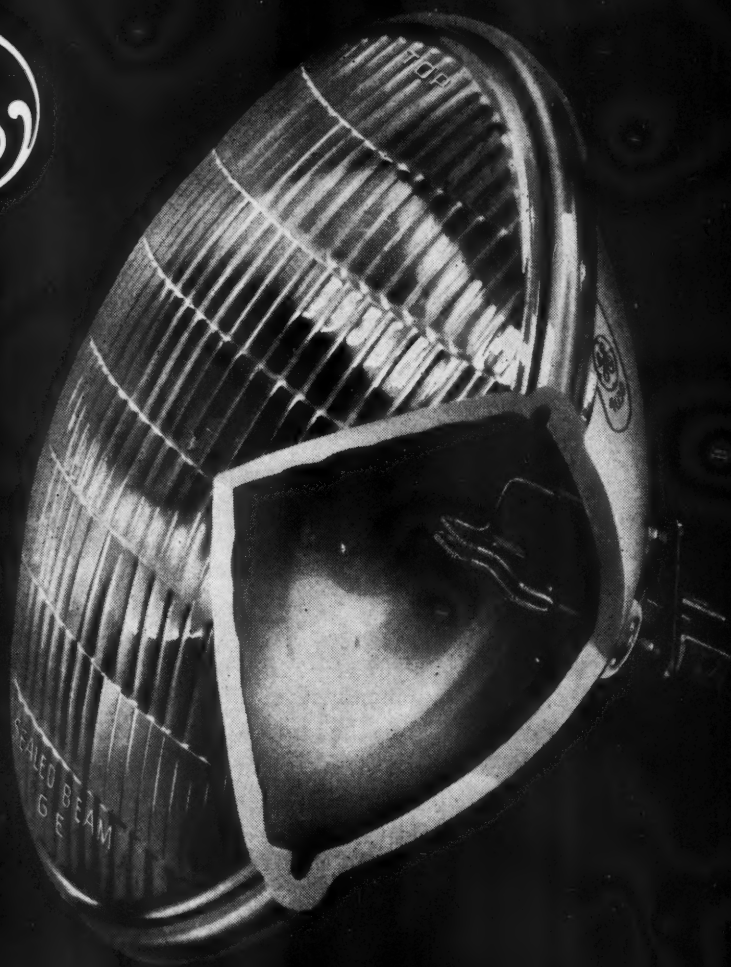
*Lift-O-Matic*

**HARNESSED AIR POWER—Instant Touch-Button Reaction in Motor Car Window Movement**

It is absolutely impossible for moisture,  
air and dirt to get into hermetically-sealed

General Electric Sealed Beam Lamps...

they *do not grow dim!*



G-E ALL-GLASS SEALED BEAM LAMPS

**GENERAL**  **ELECTRIC**

# THE FINEST BATTERY CHARGER THE TRADE HAS EVER KNOWN!

## MODEL HR-53-2

1. 100 Ampere - fast or slow charge.
2. Heavy discharge unit for individual cell test and desulphation.
3. Self-healing, magnesium-copper sulphide, dry-plate rectifier.
4. Multi-circuit tap switch - provides fine current adjustments.
5. Fully automatic time switch.
6. Specially designed, extra heavy duty steel wheels with brake equipped swivel caster.



**BY THE  
ORIGINATOR OF  
RAPID BATTERY  
CHARGING**

*see your jobber  
today - get im-  
mediate delivery.*

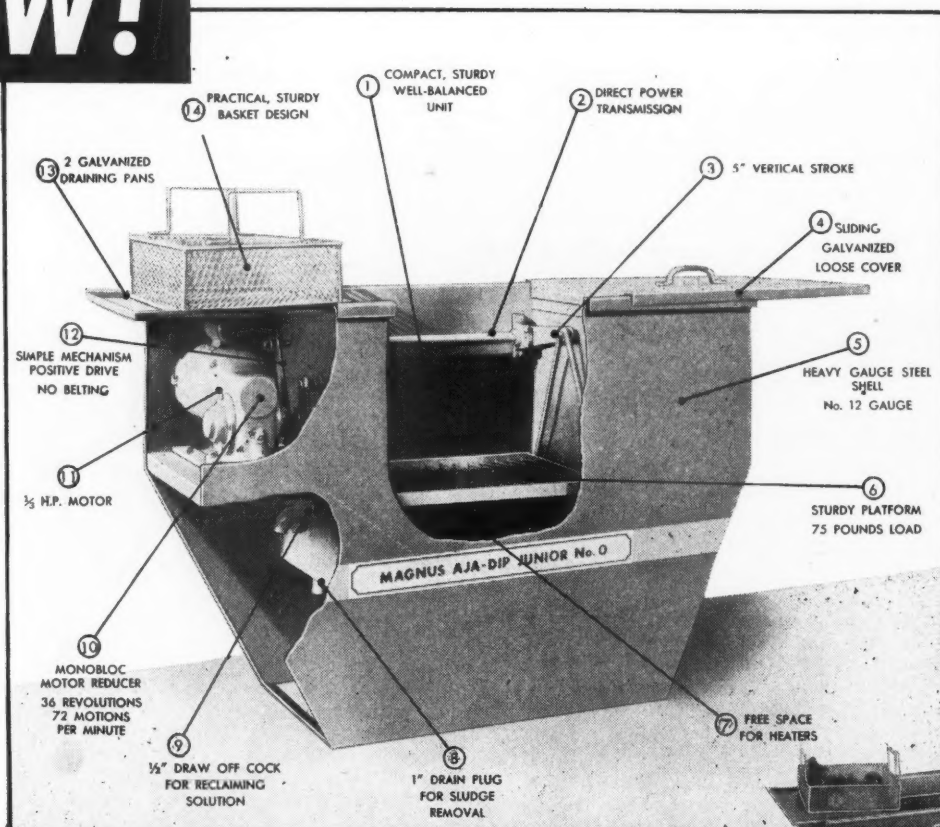
# HARTMAN

C O R P O R A T I O N O F A M E R I C A

6417 Manchester • St. Louis 10, Missouri



# NEW!



## THE MAGNUS AJA-DIP JUNIOR CLEANING MACHINE (Patented)

### FOR *Top Speed* IN PARTS CLEANING!

Now every garage can put its parts cleaning jobs on a speedy time schedule that is many times faster than is possible by any other method of cleaning. This sturdy smaller edition of the Magnus Aja-Dip Cleaning Machine offers the same unique cleaning action. Work is moved up and down *in* the cleaning solution more than once a second to give a vigorous "shearing" action to the cleaning solution.

**Carburetors...Fuel Pumps...Connecting Rods...Distributors and All Other Engine Parts**

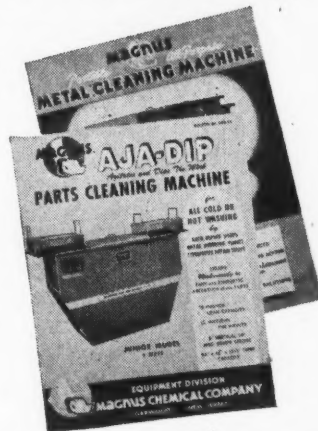
Used with Magnus 755 on pistons,

carburetors and any other carbonized parts, Aja-Dip Junior will clean five to ten times faster... and without hand work.

Used with Magnusol for dirty, greasy engine parts, this machine will clean more parts and have them ready for assembly in a quarter of the usual time.

You'll keep your Aja-Dip Junior busy every minute of the day!

For reconditioning of motor blocks, Aja-Dip Senior deserves careful investigation. This larger machine will handle both blocks and disassembled parts.



**WRITE FOR AJA-DIP JR. BULLETIN—**  
for complete data on this time  
and money saving machine and  
its many uses.

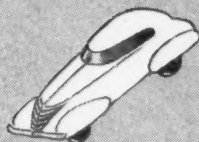
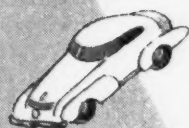
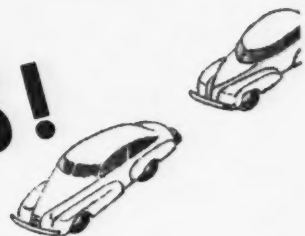
# MAGNUS



**MAGNUS CHEMICAL CO., 174 SOUTH AVE., GARWOOD, N. J.  
Automotive Cleaners & Machines**

# Good Service

means GOOD BUSINESS!



## HANSEN AUTOMOTIVE EQUIPMENT MEANS BETTER SERVICE!

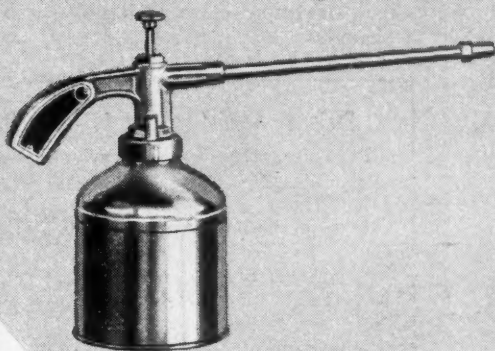
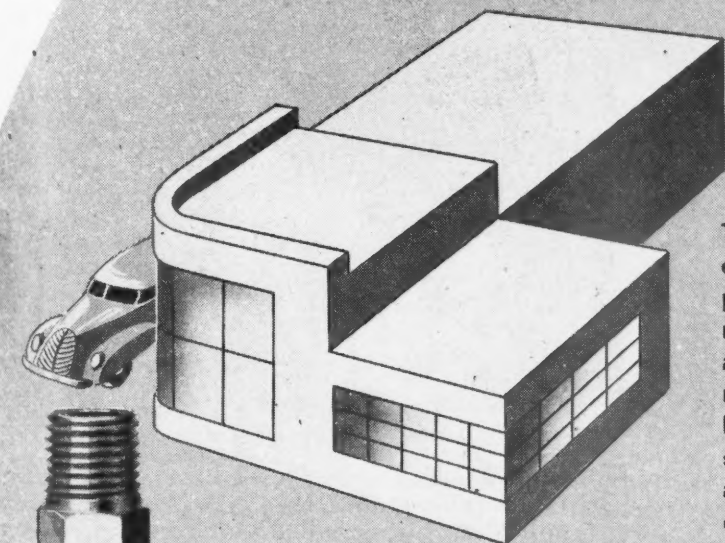
The way to influence new customers and hold the old ones is by service and that is the most important thing a service station has to sell. Hansen modern automotive airline equipment is designed and engineered to do a service job better and more economically. *The Hansen Air Hose Coupling* has been the standby of most of the service stations because it is simple and easy to operate and will not leak. All parts are fully protected consequently it can be used anywhere indoors or out. Push plug into socket it is connected and air is automatically turned on; slide sleeve back it is disconnected and air is automatically turned off. Full swivel action prevents kinking of hose. *Hansen Jet Oiler* is compact and is manually operated, projecting a solid jet of light or penetrating oil when plunger is depressed. Oil container has one quart capacity. All pump parts are enclosed in handle fully protected.

*Send for free automotive catalog.*

## HANSEN

MANUFACTURING CO.

1786 EAST 27th STREET  
CLEVELAND 14, OHIO



## He built our cities



**T**his Colossus, the American farmer, has made possible the building of our towering cities. If that sounds far-fetched, remember that when America was young, 9 out of 10 of our citizens were required on farms to raise the necessary foods and fibers. But our farmers have become so efficient that agriculture today needs only a *fifth* of our workers. The others have been able to build our towns and cities and devote their labors to making America a land of luxury . . . a land of arts, sciences, education, building, industry. . . .

\* \* \*

For 114 years Country Gentleman has carried the news of and to farmers . . . the news that has made them the most competent and most prosperous people of agriculture in all the world.

Through those years, moreover, Country Gentleman has always put the farmer's interest above all others, not only in its editorial and advertising policies, but in many services apart from the pub-

lishing of a magazine. The result is that C. G. has won a unique affection with America's farm families . . . giving added weight and prestige to every article, story, feature—and advertisement—it carries.

### Facts of Special Interest to the Automotive Industry:

"Farmers are desperate to drive home some new trucks and cars—maybe a billion dollars worth!"—Clinton Anderson.

The rural market accounts for 40% of all cars and trucks in the U. S.

Automotive dealers, by almost 3 to 1, vote Country Gentleman the most effective rural magazine in selling their customers.

Farmers' incomes have doubled in the last five years!

For the last ten years automotive manufacturers have invested more advertising dollars per issue in Country Gentleman than in any other magazine but the "Post".

# COUNTRY GENTLEMAN

**National Spokesman for Agriculture**

A CURTIS PUBLICATION





**"ROCKING-HORSE RIDE"**  
*is no fun for grown-ups*

**Give them a break with  
DELCO SHOCK ABSORBER  
SERVICE**



Check the fluid in shocks with every grease and brake job. When fluid is needed use genuine Delco Shock Absorber Fluid.



**DELCO SHOCK ABSORBERS  
A UNITED MOTORS LINE**

Delco original-equipment service parts and products are sold through independent distributors served by 20 United Motors warehouses.

**Only DELCO Hydraulic Shock Absorbers give you  
A COMPLETE LINE  
FOR COMPLETE SERVICE**

**DELCO HYDRAULIC SHOCK ABSORBERS**

DELCO PRODUCTS DIVISION, GENERAL MOTORS CORPORATION, DAYTON, OHIO

JANUARY, 1946

When writing to advertisers please mention Motor Age

137

# Chilton ANNOUNCES

## The NEW 1946 FLAT RATE and SERVICE MANUAL

• Completely New • Bigger • Contains the Greatest Amount of Essential Data Ever Put Into One Book

**NOW SELLING on  
advance of delivery**

Your Chilton Man will call on you to tell you all about the forthcoming 17th Edition. The Manual cannot be printed until we are able to flat rate the new cars, and to supply their service procedure, but it will pay you to place your order with your Chilton Man when he calls, so you may receive one of the first copies off press.



This is the great, new 1946 postwar book that Chilton promised you it would produce, now carrying a new name—The Motor Age Flat Rate and Service Manual.

It will supply your every possible need for Flat Rate Labor Charges, Material Charges, Parts Prices, Quick Reference Tune-Up and Short Cuts Data, and How-To-Do-It procedure on trouble-shooting, major and minor overhauls for ten years, from 1937 to 1946 inclusive.

It furnishes all information on the 1946 cars.

It supplies motor car and truck flat rates and truck and tractor tune-up.

The Quick Reference Tune-up and Short Cuts Data has been replaced at the bottom of each flat rate page. Over 450 parts numbers and prices for each make and model.

Chilton time-studied labor prices will again enable you to make more money, but factory time allowances are also supplied for reference purposes.

The increased size of the pages enable us to furnish more parts information, more flat rate operations, more tune-up and short cut footnotes, and more service procedure than has ever appeared before in any Manual.

As always, parts prices, labor charges and materials and flat rate data are all together for each make on two pages facing, providing the Chilton easy-to-use system, and the familiar Chilton Index of Operations will seem to you like old times when you use it.

Space does not permit describing this great, new Manual. You will have to see the big service section and the many exploded views, cross-sectional illustrations, and action pictures it provides.

*The Greatest Manual Chilton Has Ever Published*

*Famous Ford "Firsts"*

TRANSFORMING CROPS INTO MOTOR CAR  
MATERIALS, TO BENEFIT CAR OWNER  
AND FARMER ALIKE



**1<sup>st</sup>**

to "grow" automobile parts  
on the farm



It has always been a Ford conviction that agriculture and industry are natural partners. That is why Ford has pioneered the use of farm products as automobile materials.

Ford was the first car manufacturer to start growing its own timber. This was in 1919, when Ford purchased a large tract in Northern Michigan to provide a dependable source of both hard and soft woods.

Ford was the first car maker to acquire its own rubber plantations.

Ford was the first car manufacturer to plant tung trees for tung oil used in paints and enamels.

And perhaps the most striking example of this partnership of farm and factory is the Ford development of the

soya bean. Ford was first to sow, harvest and use it as a basic industrial material. The soya bean has long been an ingredient of synthetic resin enamels and plastic parts for Ford-built cars. This Ford "first" provided farmers with a new "money crop."

Today, many products go from farm to Ford, to contribute to the beauty, performance and economy of Ford-built cars and trucks. They benefit owners and farmers alike by bringing new values on the one hand . . . new income on the other. Here is another of the Ford advancements that mean so much to America.

Tune in . . . THE FORD SHOW . . . CBS, Tuesdays,  
10-10:30 P.M., E.S.T. THE FORD SUNDAY  
EVENING HOUR . . . ABC, Sundays, 8-9 P.M., E.S.T.

**EXPECT THE "FIRSTS" FROM FORD!**



## "NOCO" BATTERY CORROSION ELIMINATOR AN IMPORTANT MAINTENANCE SERVICE

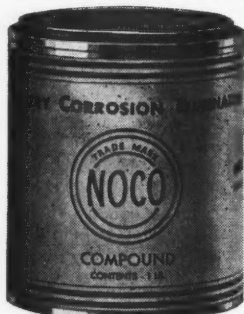


"NOCO" TERMINAL PROTECTOR WASHERS ARE MADE OF GENUINE FELT TREATED WITH SPECIAL COMPOUND TO WITHSTAND CORROSION AT THE TERMINAL POSTS. PACKED IN CANS.

Quan.	Part No.	List	Dealers' Price
50	203	3.50	2.50
100	204	6.50	4.50

## "NOCO" BATTERY CORROSION ELIMINATOR COMPOUND

PREVENTS CORROSION AND SAVES BATTERY CABLES, CARRIERS, WIRING, HOLD-DOWNS, ROAD DELAYS, ETC.



Contents	Part No.	List	Dealers
1 LB.	205	2.50	1.75
1/2 GAL.	206	6.00	4.00
1 GAL.	207	9.00	6.00

★ EASILY APPLIED ★



"NOCO" BATTERY CORROSION PROTECTORS AND COMPOUND ARE PACKED IN CARTONS AND EACH JAR CONTAINS TWO WASHERS AND COMPOUND FOR ONE BATTERY.

Contents	Part No.	List	Dealers
12 JARS	202	6.00	3.60

DISTRIBUTORS' AND JOBBERS' PRICES UPON REQUEST

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★ STOP CORROSION ★



## THE NOCO COMPANY

2074 EAST 65TH ST.

CLEVELAND 3, OHIO

## STOP THIS with PERFECT VALVE PACKING

Insure against leaky, oil-wasting valves by installing Perfect Valve Packing in every valve-and-carbon or piston ring job. Hugs close to the guide—just enough pressure to keep the oil in, yet not enough to interfere with valve action.

Graphite base lubricates without oil. Steel valve cap protects packing from oil and water.

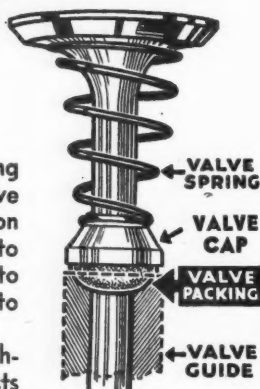
Easy to install. No special equipment required. Sizes for all passenger cars and trucks up to 1/2" valve stem.

Every customer a good prospect. Extra profits for you!

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PERFECT PARTS, INC.

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Also Distributed by  
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and  
Wilkening Mfg. Co.

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100%  
With  
10%  
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Bonds

## Willys-Overland Reveals Vehicle Production Plans

Charles E. Sorensen, president of Willys-Overland Motors, Inc., told stockholders in the annual report that the company had "designed, engineered, developed and thoroughly proved a completely new, low cost, small passenger car, embodying features and basic improvements never before in a car in this class."

The report gave the first complete outline of the company's four-part postwar production program, "spearheaded by the Universal Jeep."

The new vehicle to be produced by Willys will be constructed along the lines of a station wagon. Also announced were plans to manufacture a new light truck in four conventional body types on the same chassis. A larger commercial vehicle with a "heavier load capacity" will also be featured. The "new and unique passenger car" will round out the Willys line, it was stated.

## Award Presented to G.M. Chairman Sloan

On the fiftieth anniversary of his original association with the Hyatt Roller Bearing Co. of Harrison, N. J., Alfred P. Sloan, Jr., chairman of General Motors, was presented with a Hyatt bearing manufactured in December, 1895, when he joined the organization as a draftsman. The bearing was used on a production line shaft for more than 40 years and was presented to Mr. Sloan on behalf of the Hyatt 25-Year Club by J. J. Cless, Hyatt's oldest active employee in point of service.

## Classified Advertisements

### Additional Lines Wanted:

DORING & EYER SALES & ENGINEERING CO., 404 Reliance Bldg., 216 East 10th St., Kansas City 6, Missouri. Missouri, Kansas, Nebraska and Iowa. Principal Lines: Automotive and Hardware.

REBUILT CONNECTING RODS — ALLIED MIRRO-MATIC FORD V-8 connecting rod service. A new process, a better product, better service. Precision mirror finish bearing surface; accuracy, exact size to standard; perfect pin fit to standard; each rod bears a new rod guarantee. Ship us your V-8 rods, we rebuild your rods only, we do not exchange rods. Service 10 to 20 days. Special prices to Motor Rebuilders. ALLIED MANUFACTURING CO., 2109 O STREET, LINCOLN, NEBR.

52 good filling station ads, \$5.00. Not a mat service. Sim's Service, Saline 2, Mich.

AGENTS WANTED to sell successful fluid insulator to automotive supply trade. Waterproofs ignition system, batteries. Meets government specifications. Liberal commission. Box 347, Grand Central Annex, N. Y. C. 17.

## FLEET OWNERS AND BUS OPERATORS

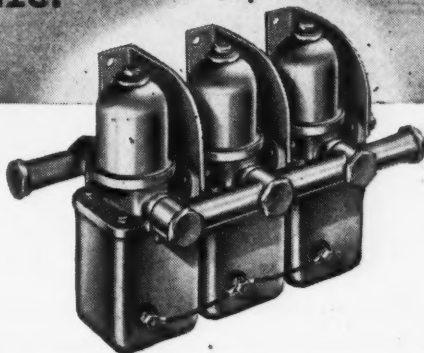
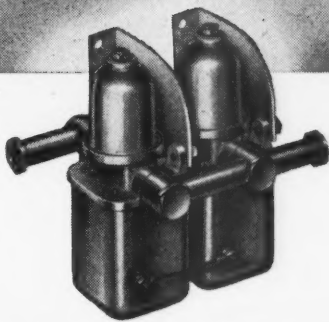
### You Can:

- A** Reduce your fuel pump inventory
- B** Simplify fuel pump maintenance
- C** Increase vehicle mileage between overhauls
- D** Avoid fuel pump trouble on the road
- E** Reduce fuel costs
- F** Improve vehicle performance

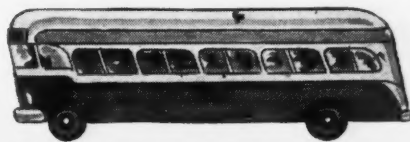
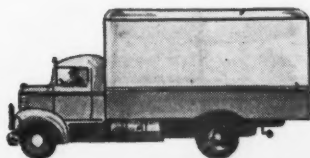
By Standardizing on

## The AUTOPULSE ELECTRIC FUEL PUMP

It is the **ONE PUMP** which will serve **EVERY** vehicle in your fleet regardless of make or size.



### AUTOPULSE



Write us direct for quotation

# AUTOPULSE Corporation

2321 Brooklyn Ave., Detroit 1, Michigan





**UNBALANCED TENSION  
Kills TUBES**

**RU GLYDE**  
*Kills* **UNBALANCED  
TENSION**

● Synthetic rubber is a godsend. But watch out! Improper mounting means a ruined tube in no time. With Ru-GLYDE, the ready-to-use, scientific wet lubricant, correct mounting is simple. Tube and flap seat with minimum pressure, and slip, not stretch, into place. 100% safe. Easily applied. Won't cause rim rust.

Proved in actual use on all types of rubber parts for the past five years. Approved and adopted by leaders in the industry. Available in gallon cans from leading jobbers and major oil companies.

**THE Approved  
RUBBER  
LUBRICANT  
FOR  
Synthetic  
TIRES · TUBES · FLAPS**

**AMERICAN GREASE STICK CO.  
MUSKEGON · MICHIGAN**

### Combination Attachment Arbor for Motor Shafts

A combination attachment arbor for half-inch electric motor shafts is announced by A. D. McBurney, 939 W. Sixth St., Los Angeles, Calif. The Super Arbor, No. 150, is designed to take grinding wheels with  $\frac{3}{4}$  in. holes on main shaft, or  $\frac{1}{2}$  in. holes on the small ends. The extension can be used for rag or wire wheels or for circular saw blades. The extension also holds  $\frac{1}{2}$  in. 24-thread drill chucks which in turn grip drills from No. 60 to those half-inch in diameter.

It fits well over and onto the main motor shaft. A one-inch grinding wheel is thus mounted directly on the main shaft and not out on the arbor extension. This feature eliminates the possibility of "whipping" and dangerous disintegration of the grinding wheel. Cost of the Super (arbor) is \$1.50.

### New Parts Cleaner

A new parts cleaner known as Ga-Mar has just been announced by the Gale Martin Corp., 540 W. 24th St., New York 11, N. Y.

The cleaner is a drawer-like container which slides on rods, bolted to the under side of the bench. When the cleaner is in use it is pulled out from under the bench and the cover folded back over the top of the bench to act as a tray for cleaned parts. A sump is provided which may be lifted out and cleaned, allowing the fluid to be drained out through the drain plug for reuse.


BRAKE SHIM STOCK • RELINING EQUIPMENT

CLUTCH FACINGS • RIVETS

HYDRAULIC BRAKE PARTS • BRAKE FLUID

NOW DON'T YOU WORRY ABOUT HIM I'VE GOT --

**SOUTHERN**  
REG. U.S. PAT. OFF.  
**BRAKE LINING**



**SOUTHERN**  
FRICTION MATERIALS CO. - CHARLOTTE, N.C.

### New Organic Soft Solder Flux

A new organic soft solder flux which does not normally leave a corrosive residue on the work, is announced by Superior Flux Co., Cleveland, Ohio. This is known as "Superior No. 30 Supersafe Soft Solder Liquid Flux."

Because of its activity in effecting the wetting of the joining surfaces, this flux, in many cases, contributes to easier soft soldering of metal combinations which have been considered difficult to solder.

The manufacturer claims that, if after solder, the work piece is well washed with water, all corrosion forming residues are completely and permanently removed.

It may be used in soldering copper, steel, silver, brass, various alloys and electroplated parts such as nickel plate, silver plate and cadmium plate.

### New Tubing Fittings

Flexigrip tubing fittings which eliminate end preparation or soldering of the tubing and yet produce a strong, leak-proof and flexible joint have been announced by Gustin-Bacon Manufacturing Co., of Kansas City, Missouri. The Flexigrip fitting, made in standard sizes from  $\frac{1}{8}$ -in. to  $1\frac{1}{2}$  in. O.D., consists of four parts—the body, a gripping ring, synthetic rubber gasket and nut.

Elimination of flaring, swedging, or soldering, the tube end adds to the strength of the joint as well as saving time and labor.

Flexigrip tubing fittings are available in brass, aluminum or steel.

**Don't Let Your  
Customers'  
Cars Skid**

SELL AND SERVICE

**WEED  
CHAINS**

**WEED AMERICAN  
BAR-REINFORCED** Best Value in Tire Chains



for  
**PRECISION  
REPAIR  
WORK**



Write for catalog sheets on all Logan Lathes


No. 210 Bench Model, Swing Over Bed, 10 $\frac{1}{2}$ "

**Logan**  
**ENGINEERING CO.**  
Chicago 30, Illinois  
A Name To Remember When You Think of Better Lathes

### KEEP OIL FREE FROM ABRASIVES

KEEP IT CLEAN WITH

**PUROLATOR**  
THE OIL FILTER



**PUROLATOR PRODUCTS, INC.**  
Newark 2, N. J.

Founder and leader of the oil filter industry



IDEAS GALORE FOR A  
BETTER STORE...



18  
COLORFUL  
DESIGNS

*New  
Colorful Book*

ON VISUAL FRONTS SOON OFF THE PRESS!

No matter what kind of store you are planning, designing or operating—you'll find plenty of good, usable ideas in this book.

They're brand-new ideas—suggestions on how to make your storefront get attention, direct that attention inside and build store traffic. This book explains how and why the Visual Front adds merchandising power to a store.

Here are just a few of the many subjects covered in this book:

*How to put your whole store on display.*

*How to unite inside and outside in one decorative ensemble.*

*How to make your store more inviting.*

There's product information on:

Polished Plate Glass

Golden Plate Glass

Heat Absorbing Plate Glass

*Tuf-flex\**—the tempered plate glass

*Vitrolite\**—colorful structural glass

*Glastone\**—glass-faced masonry block

*Thermopane\**—transparent insulating unit

Blue Ridge Decorative Glass

Mail coupon for your copy.

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*a Great Name in* **GLASS**

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Please send me a copy of your new Visual Front Book.

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**COMPANION PRODUCTS**  
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**GLOBE** Spinning Power  
BATTERIES

Full Spark  
PLUGS



GLOBE-UNION INC., Milwaukee 1, Wis.



**Smash-Proof  
CREEPERS**

Sold by all leading jobbers

**HULBERT MANUFACTURING CO.**  
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MUFFLERS**



*Stop that  
Noise!*

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**PYRENE KEEPS 'EM  
ROLLING**

with  
Rugged, longer-  
wearing Tire Chains  
and  
Handy, speedy Fire  
Extinguishers



**Pyrene Manufacturing Company**  
NEWARK 8 NEW JERSEY

... For Faster and  
More Accurate  
BATTERY TESTING

**IMPERIAL "K"**  
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BATTERY HYDROMETER

★ Thermometer Type  
★ Shatterproof Glass Jar

THE IMPERIAL BRASS MFG. CO.  
1217 W. Harrison St. Chicago 7, Ill.

ORDER  
FROM  
YOUR  
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AMERICA'S FASTEST  
GROWING RING LINE  
MOOG X-PLUS  
FULL POWER PISTON RINGS



**MOOG INDUSTRIES, INC.**  
ST. LOUIS, MO.

### New Grey-Rock Catalog Is Distributed for Use

Catalog No. 645 has just been shipped to distributors of Grey-Rock automotive products for their salesmen's use by United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa.

An innovation is a 20-page section printed in 3 colors and bound in the front of the book which tells how Grey-Rock brake linings and clutch facings are made . . . gives highlights of Grey-Rock advertising and merchandising over the past decade . . . shows the many current sales-helps available . . . the product story . . . the many services Grey-Rock provides their distributors and dealers. It's a wholesalers salesman's sales portfolio.

The catalog contains the usual complete information on all types of Grey-Rock brake linings and clutch facings with complete specifications and application data.

Also included in the back of the book is a 24-page section devoted to the development of the Grey-Rock Line of Fan Belts, Radiator and other automotive hose . . . how they are made . . . advertised and merchandised. Specifications and application data are also included on these products in this section.

Grey-Rock also announces preparation of a new Dealer Catalog which will be ready for distribution in the near future.

### Dual Spiral Expansion Reamer Introduced

Lempco Products, Inc., Bedford, Ohio, announces their new design Dual-Spiral Expansion Reamer. The principal change in the new design is a solid one-piece body all the way from the driving end to the lower lock nut. This one-piece construction considerably reduces the number of component parts. In addition, because of its increased rigidity, the cutting blades spiral even more concentrically than previously, and runout is held to an absolute minimum, insuring accuracy to extremely close tolerances.

FOR PROMPT COMPLETE SERVICE  
ON AUTOMOTIVE PARTS...

*Your NAPA Jobber  
is a Good Man to Know!*



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Detroit 1, Michigan

SOLVENTS FOR ALL TYPES OF PETROLEUM RESIDUES

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Makers of

**LOOSITE:** to clean the engine  
**SILOO:** to keep it clean

Where  
Secure  
Seals Are  
Vital



**VICTOR**  
GASKETS, OIL SEALS  
GREASE RETAINERS

**REBUILT GENERATORS  
and STARTERS**  
also REWOUND ARMATURES  
For All Popular Make Cars

IMMEDIATE DELIVERY

We stock only original units. All generators  
rebuilt with rewound armatures.

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**SAFE** and **SPEAKER**  
QUALITY



**PERMANENT  
Vulcanized  
TIRE & TUBE REPAIRS**  
for natural or synthetic rubber.

**J. W. SPEAKER CORPORATION**  
Milwaukee 12, Wisconsin



*Illustrated here—the 1946 Hudson Commodore Sedan*

# The new Hudsons are here!

**High-spot facts about 1946 models which  
bring new meaning to a fine old name**

From their enthusiastic reception wherever they have been shown, it is evident that these new 1946 Hudsons are headed for spectacular popularity—with dealers and public alike.

"Eye appeal" is one reason—the brilliant new front end design, the smart exterior styling, the wholly new interiors. "More that's new than we had thought possible!" dealers tell us.

Buyers like the choice of *two* series offered by Hudson for 1946—a Super Series and a distinguished Commodore Series, both with a wide range of de luxe equipment.

They like the wide range of new body colors—nine standard colors, with four beautiful two-tone combinations

and two special colors available at small extra cost. They like the choice of power—a choice, in either series, of the famous Hudson 102-horsepower Super-Six and 128-horsepower Super-Eight engines.

They like the features that have made Hudson America's *safest* car—Double-Safe Hydraulic Brakes, Patented Auto-Poise control, and many others. They like "no-clutch, no-shift" driving with improved Hudson Drive-Master, and the unmatched comfort of Airfoam seat cushions.

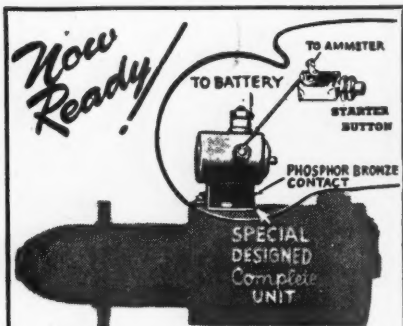
These are a few of the reasons why we say with confidence that Hudson will sell a substantially larger share of the total automobile market in the years just ahead.

*The distinctive Hudson Triangle emblem—in a new dress for a new day—will soon be a familiar sight on America's highways.*



**HUDSON**  
THE FINE CAR OF LOW PRICE





### Universal Change-Over SOLENOID STARTER UNIT

Designed and built for durable service and performance. Every Chevrolet and Plymouth owner needs this unit. Fits all cars with regular Bendix Starter.

List each . . . . . \$3.75

Sold Only Thru Jobbers

Manufactured & Distributed by

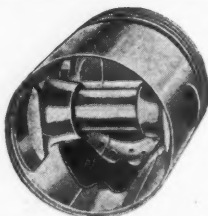
**AUTOMOTIVE MAN'G. Co., Inc.**  
1050 W. HUBBARD ST. CHICAGO 22, ILL.



WITH

## MASTER RECAMS

MASTER RECAMS are individually designed for all late model cars; easily installed without removing pistons. The profitable way to Stop Piston Slap, Oil Pumping and Motor Noise.



50¢ EACH

REGULAR DISCOUNTS TO JOBBERS AND DEALERS

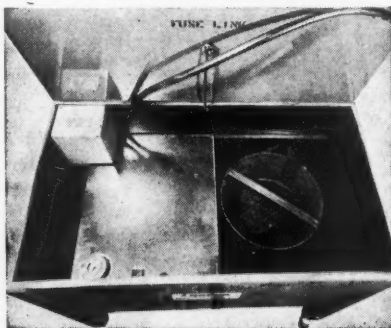
**WHERRY ENGINEERING COMPANY**  
8227-29 Morganford Rd., ST. LOUIS 16, MO.



**BUELL MANUFACTURING CO.**  
2991 COTTAGE GROVE AVE., CHICAGO 16, ILL.

### Metal Parts Washer

The D. C. Cooper Co., 1467 South Michigan Ave., Chicago 5, Ill., announces the development of a new metal parts washer for large or small plants. Cooper's metal parts washer is equipped with special spray hose,



electric motor, spray pump and sturdy basket for handling small parts. Special gauge tells at a glance amount of solvent in tank. Only one cleaning operation is required for all types of metals including aluminum, pewter, white metal, steel and iron.

### Lead Allocations to Be Reduced in First Quarter

Lead allocations to producers of passenger car batteries and producers of tetra ethyl for gasoline will be reduced in the first quarter of 1946, the Civilian Production Administration announced.

However, approximately 4,200,000 passenger car batteries can be produced from the revised quotas in the first three months of 1946 compared with 3,200,000 units produced in the similar 1945 period, CPA said. Fourth quarter (1945) production was estimated to be considerably above the 4,200,000 level.

Under the amended lead conservation order (M-38) issued late last month, the first quarter quota for automotive type batteries will be reduced to 22 per cent of the amount used during the calendar year 1944, a reduction from 26½ per cent, which was the quota in the preceding quarter.



GUARANTEED AUTOMOTIVE CHEMICALS

**SERVICE SUPPLY COMPANY**

1115 SEVENTH STREET, DENVER 4, COLORADO



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Spray-Painting Equipment —  
Spray Booths — Exhaust Fans —  
Air Compressors — Hose and  
Hose Connections — Oil Guns.

See your authorized De Vilbiss distributor  
**THE DEVILBISS COMPANY**

Toledo 1, Ohio

## BUY VICTORY BONDS

Keep Your present HALL EQUIPMENT performing like new. Service Parts and Factory Reconditioning IMMEDIATELY AVAILABLE. Ask your jobber or write the Factory for Information.

**THE HALL MFG. COMPANY**  
TOLEDO 7, OHIO

Make Big Profits on Small Investment in

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(DEPT B.)

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To Help You with Your Reconversion Problems



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AA-52



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PRE-1940  
CARS and TRUCKS  
with

## Pathfinder

"SEALED BEAM"  
HEADLAMP  
ADAPTERS

Approved in All States

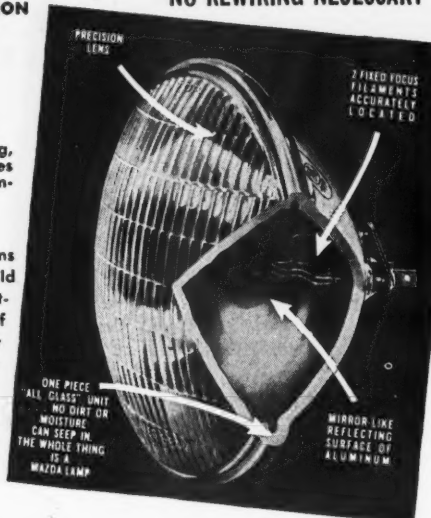


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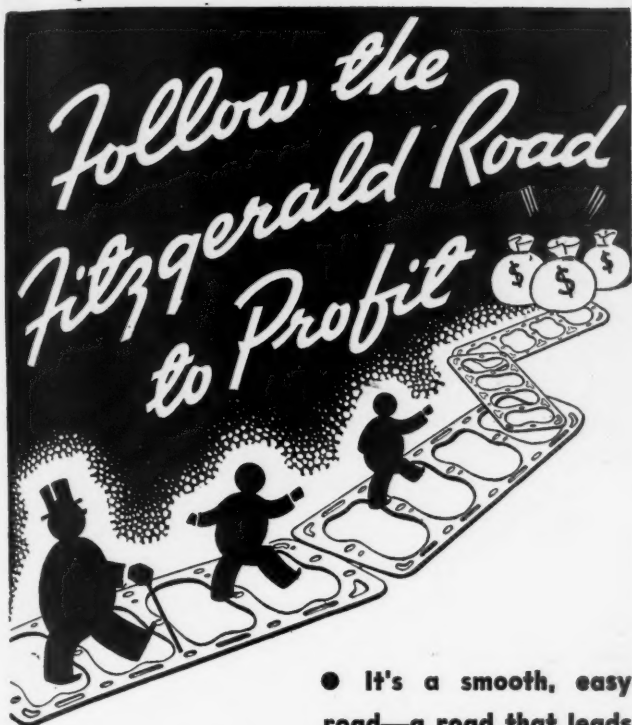
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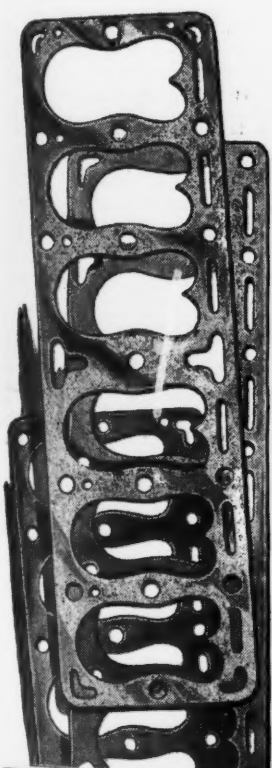
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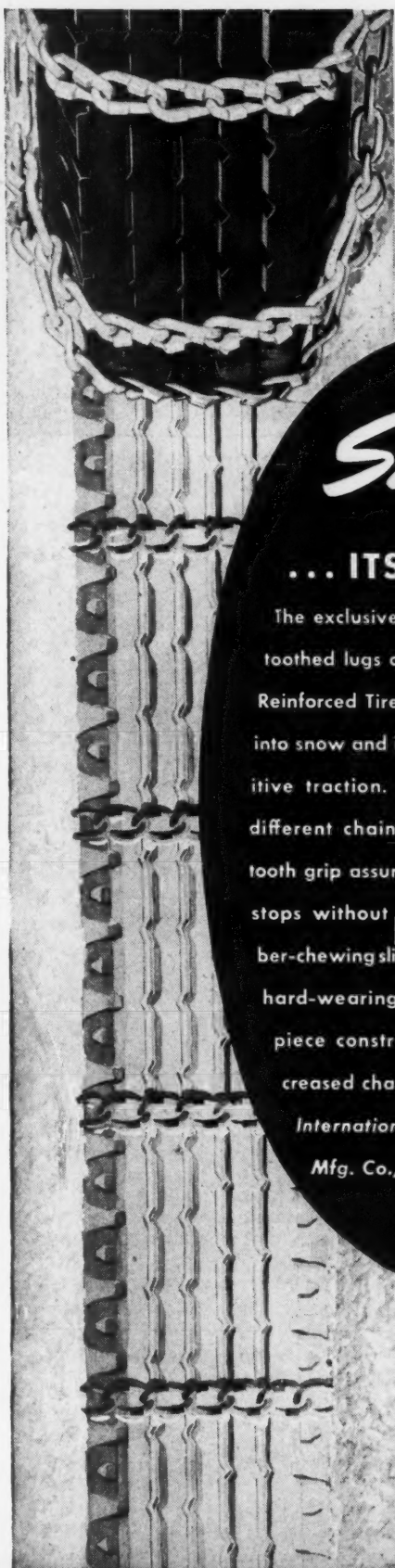
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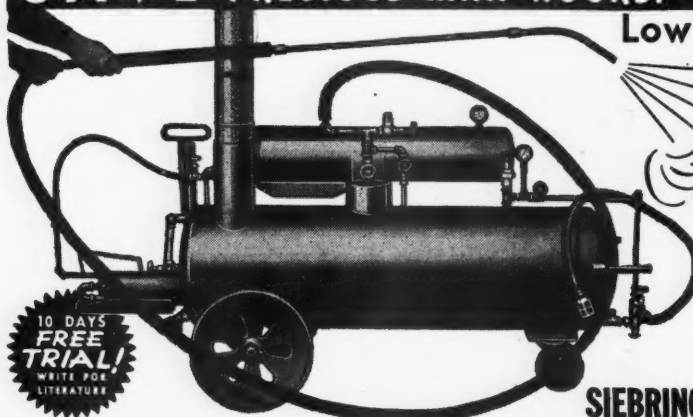
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\*CANADIAN PAT. NO. 223,568

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*Lug-Reinforced*  
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THE CHAIN WITH THE SAW-TOOTH GRIP

**SAVE PRECIOUS MAN HOURS! SPEED ALL REPAIR WORK!**  
**Low Cost . . . Efficient . . . Portable!**



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FREE TRIAL!**  
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Cleaning With  
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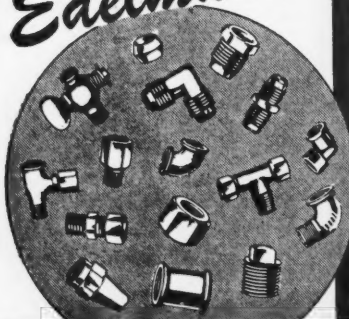


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**OAKITE** *Specialized* **CLEANING**  
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"TOPS" for Quality  
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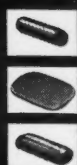
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Softie"**  
 ...HEALS ITSELF



TESTED! A 6-inch cylinder of Flex-O-Cryst pressed under 10-ton pressure into sheet (1/8 inch thick) slowly returns to original shape and size.



**NEW PLASTIC DISCOVERY**—Flex-O-Cryst—used in **NUPLA** Hammers is more durable than rawhide because it does not curl or deform. Unlike rubber, it is not affected by oil or gasoline. Will not rebound or sting. Unlike many plastic materials, it does not chip or crack.

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5 SIZES—29 WEIGHTS**



**MIGHTY**  
but Gentle

**NUPLA** **PLASTIC  
HAMMERS**



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**FAD-A-WAY  
AUTOMOTIVE**

**WHEEL BALANCE WEIGHTS**

**TRUCKS • BUSES • PASS. CARS**



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D-5196**

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"KING" FAST Battery Chargers have two accurate D'Arsonval (moving coil) meters. One indicates the ampere charging rate and the other indicates the condition of battery and state of charge. The "KING" two meter method eliminates the complicated multiple scales and switching mechanism that is necessary with only one meter. All meter readings are taken at a glance without manipulating any switches. The meters have colored bands that are easily understood. "KING" makes a complete line of Battery Chargers, Motor and Ignition Testers, Gas Analyzers and other testing equipment.

Ask Your Jobber or Write Us

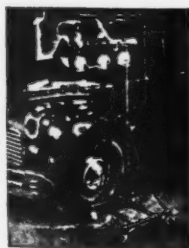
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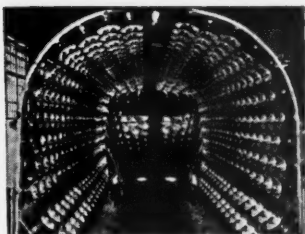
GOOD "KING" PRODUCTS SINCE 1914

## FASTER, BETTER DRYING with NALCO INFRA RED DRYING UNITS

The radiant, penetrating heat of Nalco Dritherm Infra Red Units provides speedy, uniform drying of auto finishes. Cuts drying time to a fraction. Eliminates waiting time, reduces labor cost. More jobs per day and greater profits per job!



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OR AN  
ENTIRE BODY JOB**



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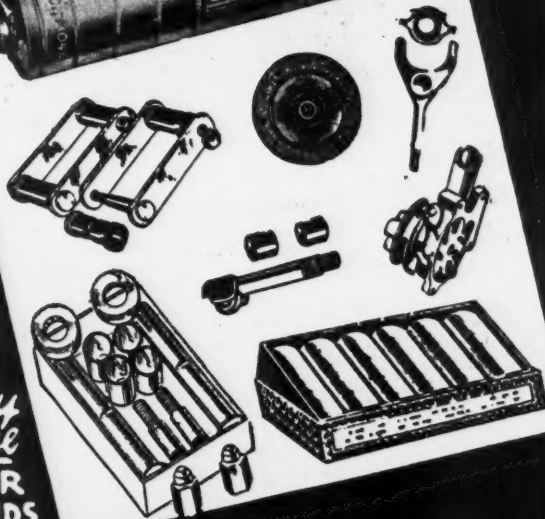
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ELECTRIC LAMP CO.**

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*For Dependable  
Quality Replacements  
LINE UP WITH LION NOW!*



*Buy  
More  
WAR  
BONDS*

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**SMOOTH-RUNNING • MORE POWER**

Ruggedly built. Patented WYCO Non-Metallic Innerliner for longer life inside shaft. No kicks about shaft breakdowns.

**QUICKLY  
INTERCHANGEABLE**

Tools for wire brushing and rasping. Constant high speed from any 110, or 220 AC outlet. 1725 or 3450 RPM. Many other uses: removing paint and rust—body sanding—sizing, etc. Easily movable around shop.

3 Models: Type A, floor stand, Type B, bench, Type S, suspension. Also available with "Roll Easy" Truck Base, Type T.



MODEL 2V  
COMPLETE  
ONLY \$62.00

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WYCO Flexible Shaft Equipment for every need Wire or write.

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1946  
Forecast*

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WIDER MARKETS  
KEENER COMPETITION  
GREATER ECONOMIES  
NEEDED



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For quick, accurate reconditioning of any type valve seat. A wide assortment of wheels and pilots. New high speed driver for heavy duty service. For passenger car, truck, tractor and Diesel jobs.

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will help you glide into your 1946 programs with ease and every assurance of better and more economical production. These famous tools are better than ever . . . embodying the experience gained since 1897 PLUS the lessons learned "the hard way" during the war years.

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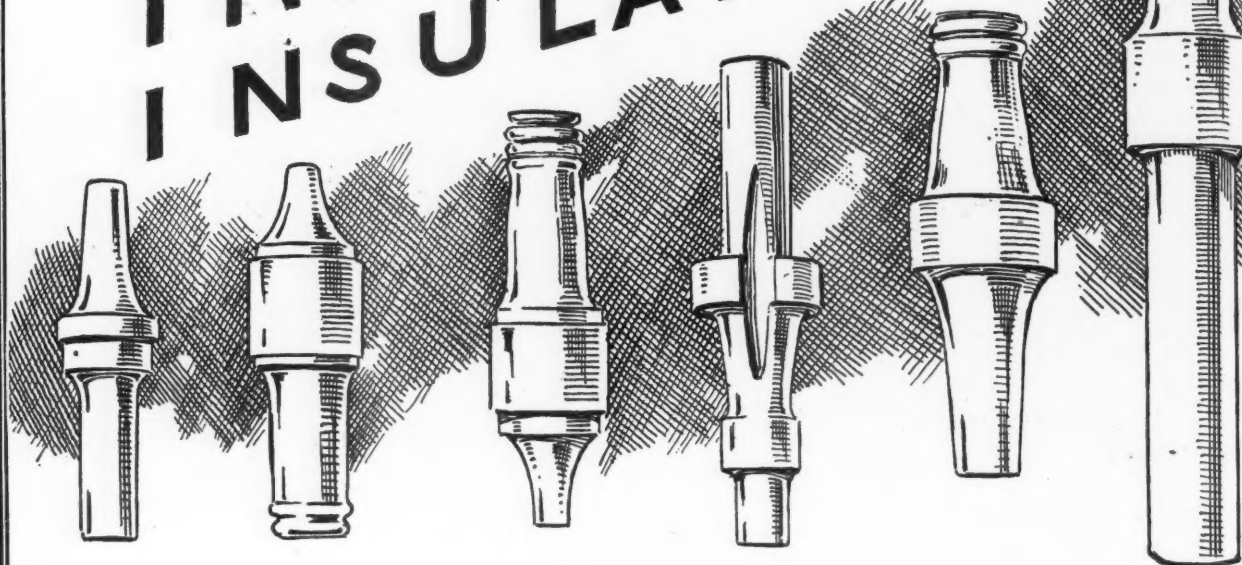
Model 14RG Regular  
Model 14HD Heavy Duty

Ball bearing throughout. Universal motor, chrome nickel steel, heat treated gears packed in grease and sealed. 3-jaw geared chuck. Rubber covered cable and indestructible rubber attachment plug.



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31 Years

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THE PIONEER PRODUCER AND STILL  
THE LEADER**

*Formulae to meet all requirements of*  
**AUTOMOBILE — AIRCRAFT — GAS OR OIL ENGINE  
AND OIL BURNER IGNITION**

*Used by more spark plug  
manufacturers than any other*

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Burd "SUPER Hi-Speed" Oil Rings are scientifically engineered to restore new-car pep and economy to badly worn engines. The cast iron segment is "Graf-Flox" treated for quick seating.



Burd "Hi-Speed" Compression and Oil Rings are "Graf-Flox" treated — no run-in required. They effectively seal highest compression pressures and maintain accurate oil film.

**BURD PISTON RING CO. • ROCKFORD, ILLINOIS**



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**H**ammered

ENGINEERED TO

*Match Any Job*

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Koppers Company, Inc., American Hammered Piston Ring Division, Baltimore, Md.

**American Hammered Piston Rings**

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